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A STUDY OF THE PROTOTYPES OF THE MODERN NON-PROFESSIONAL SCHOOL AMONG THE GREEKS AND THE ROMANS.

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I.

THE SCHOOLS OF THE GREEKS.

The greater number of the tastes and pursuits that characterize us as a civilized people have been passed on to us, not from our German or Anglo-Saxon or Celtic forefathers but from a race that flourished two or three thousand years ago chiefly in the lands that lie within and about the Ægean Sea. Along with this civilization we have inherited from them the institution by which the sciences and arts which characterize it are handed down from generation to generation, the non-professional school. (Hatch, Hibbert Lectures, 1888, pp. 28 and 43.)

These people, the Greeks, were remarkable for their intellectual keenness and eagerness, and particularly for their exquisite sensitiveness to beauty and the consummate skill which enabled them to gratify it. But just as the Greeks were, on the whole, distinguished by these qualities from other races, so were the Athenians of the 4th and 5th centuries B. C., from the other Greeks. It is among the Athenians that that Greek culture which has remained the basis of the culture of all great subsequent civilizations of Europe, Asia Minor, Africa and America attained its highest development. And it is in the history of this people that we first find standing forth clearly the prototype of the modern elementary school. In stating this it is not forgotten that the school was not made, but grew, and that, in stages more or less embryonic, it is found earlier not

only among other Greek peoples but in the older civilizations of Egypt and the Orient to which the Greeks were so much indebted. Nevertheless, beyond the Athenian period of the 4th and 5th centuries the story of the school becomes relatively vague and discontinuous. On the other hand the clearly marked historical continuity between the Athenian schools and those of to-day and the similarities existing between these as to aim and course of study seem to distinguish the above-mentioned period as the most suitable at which to take up the story of the modern non-professional school.

The Conditions of Development.

The conditions in Athens during this period were exactly of such a character as to favor a remarkable efflorescence of human culture. Her irregularly indented shores gave access on almost every side to the Ægean whose waters afforded communication with alien civilizations and with numerous other Greek communities, which, in many instances, isolated by the mountains or by the sea, had maintained their independence. The smallness of these states conduced to their rapid political development toward a democracy which exercised in a high degree an intellectually stimulating influence upon the members of each. In speaking of the successive victories of the Athenians over the Boeotians Herodotus says, "Thus did the Athenians grow in strength. And we may find proof, not merely in this instance but everywhere else how valuable a thing freedom is; since even the Athenians while under a despot, were not superior in war to any of their surrounding neighbors, but so soon as they got rid of their despots, became by far the first of all." (V, 78.) The multiplicity of independent states alike in race and language resulted in that rich variety of social and political organization and of human endeavor that contributed much to the intellectual life of the Greeks.

These features of the political organization and geographical environment of the Athenians combined with the wealth and leisure of the upper class account in no small measure for the development of the brilliant civilization of the Periclean age amidst which existed the Greek schools concerning which we have most information.

The population of Athens was made up of three distinct classes: first, the native citizens (the wealthier among them being landholders) who jealously restricted to themselves all political privileges attaching to membership in the democracy: secondly, aliens largely engaged in industry and commerce; and thirdly, the slaves who constituted over 70% of the entire population. Amid this population there existed three classes of teachers and school for boys:—the Grammatist who taught

reading and writing in the elementary school, the Citharist who taught in the music school, and the Paedotribe who conducted the physical exercises in the palaestra. All classes seem to have had more or less instruction in elementary reading and writing. The music school seems in the time of Pericles to have become an institution giving secondary instruction and was attended for the most part by the children of the leisure classes.

The origin and development of these schools and the character of their courses of study will be in some measure explained if we note certain features of the social life of the early Greeks.

EDUCATIONAL FEATURES OF THE SOCIAL LIFE OF THE EARLY GREEKS LATER ORGANIZED IN THE WORK OF THE SCHOOLS.

Music. It is difficult for us to appreciate the importance which the Greeks ascribed to the art of music, a composite of arts distinguished by us as poetry and music. (Plato, Republic, 376D.) It was a chief form of entertainment in the home (Plato, Lysis; Jowett's Trans. I, 56) and at social gatherings where the lyre was passed from hand to hand as each entertained the rest with a song. (Panofka, Bilder, d. antiken Lebens pl. 4, No. 5; Hibbert Lectures, 1888, p. 51). Not only were the Greeks peculiarly sensitive to the subtle beauties of tone and rhythm but they attached great importance to the content of their poetry. The writings of Plato, Aristotle and Demosthenes abound in quotations from the poets. To the Greeks the poet was a counsellor, an inspired prophet giving utterance to the wisdom of the ages. (Plato, Ion, 533-534) (Plato, Protagoras, 316D.) In poetry was embodied their theology (Herodotus 2, 53), their history and their science (Aristophanes, Frogs, 1030). Moreover, poetry performed much the same function among the Greeks as religion with us. (Plato, Republic 365E.) Christianity is with us so eminently a centre of moral influence that it is hard for us to realize that this was not so with the religion of the Greeks. Its main purpose was merely to enable men to avoid the anger of the gods. For that moral stimulus and direction that we seek in religion the Greek turned to poetry (Adams, Civilization During the Middle Ages, p. 53; Girard, L'éducation Athenienne, 141).

The earliest poets must have recited their own compositions and in later times, "The lyric and dramatic poets taught with their own lips the delivery of their compositions and so prominently did this business of teaching present itself to the view of the public that the name Didaskalia, by which dramatic composition was commonly designated, derived from thence its origin." (Grote, Hist. of Greece, II, 186.) The thoughts

of the early philosophers were usually published in poetic form and Xenophanes, even in attacking the older poetry as teaching serious and harmful errors expresses himself in verse. (Gomperz, Greek Thinkers, I, 155,158.)

Again, music, like gymnastic had become intimately associated with the religion of the Greeks. It became an important part of the religious ceremonies in which it was incumbent upon all to join. Thus, "There existed a multitude of sanctuaries in the Greek land" says Curtius, "whence issued forth an impulse toward mental culture and popular exercise of the mental powers. Thus in the land of Arcadia, Artemis Hymnia was from a primitive age highly venerated by all Arcadians. Her feasts were celebrated with songs and from her temple went forth those ordinances which made the cultivation of music incumbent as a sacred duty upon all the inhabitants of the land." (Curtius, History of Greece, II, 29.)

The importance of music in religion and as a means of entertainment in the public and private social life of the time together with its intrinsic worth, embodying as it did, often in supremely beautiful form, the most precious of the culture possessions of the race go far toward explaining why music was the first of the liberal arts to be made an object of systematic study by the Greeks and why the earliest of the institutions which grew up among them for the systematic instruction of the young were music schools.

The Declamation and Exposition of the Rhapsodes. A function similar to that performed by the teacher in the music school was performed for the general public outside of the school by the rhapsodes. In order that their hearers might better appreciate the poems which they recited, the rhapsodes were accustomed to preface their performances with explanations. "Very true, Socrates," says the rhapsode, Ion, in Plato (Ion, 530 C), "interpretation has certainly been the most laborious part of my art; and I believe myself able to speak about Homer better than any man; and that neither Metrodorus of Lampsacus, nor Stesimbrotus of Thasos, nor Glaucon nor any one else who ever was had as good ideas about Homer as I have or as many."

The Professional Teaching of Reading and Writing by the Scribe. The establishment among the Greeks of schools for the teaching of reading and writing could scarcely have occurred otherwise than as a result of the growth among them of an appreciation of the value of the art of letters. According to Curtius for a long time they despised the written as compared with the living spoken word. Nevertheless its advantages even in the study of literature were too great to be overlooked, and a course in the reading and writing school of the

grammatist became preparatory to that in music. Girard says, "In spite of this anteriority of music it was not with it . . . that education began. The child received musical instruction only when he had learned to read and write." (L'éd. Ath., 162.)

In the earliest stages of the introduction of the art of letters into a society it is usually practiced professionally by scribes. Hence these would naturally be the first teachers of the art. That the profession of the Greek elementary teacher is an outgrowth of that of the scribe seems to be indicated by the fact that he is called by the same name, grammatistes, *i. e.*, scribe. The word is used in this latter sense in Herodotus 2, 28; 3, 123 and elsewhere. Jowett translates Charmides, 161 D as follows: "And does the scribe write or read or teach you boys to write or read your names only?" Desmosthenes speaks of the two functions of scribe and teacher as being exercised by members of the same family. (Embassy, p. 194 (Bohn). In Diogenes Laertius X, IV, we learn that Protagoras from being a scribe became an elementary teacher.

There were writing schools for the poor as well as for the rich. The work of the music schools being of a more purely cultural character these institutions were attended for the most part by the comparatively well to do classes. Plato makes Protagoras say after describing the school work in music. "This is what is done by those that have the means, and those that have the means are the rich; their children begin to go to school soonest and leave off latest." (Protagoras, 326, C.)

Military Training and the Sacrificial Games. The third of the institutions which existed among the Athenians for the training of the young, the palaestra or school for physical training, is one that has not been handed down to later times. It seems to have had its origin in the military training of citizens so necessary to the security of the primitive state. In Plato's Laws (633 A), the Athenian stranger asks, "Tell me . . . were not first the syssitia and secondly the gymnasia invented by your legislator with a view to war?" The reply is "Yes." This is the view held by Lucian writing in the second century A. D. He has Solon state its purpose to Anacharsis, the Scythian thus, "If ever our young men have need to make use of their skill in armor they are already experienced. It is certainly very evident that a person so trained, upon grasping an enemy will more quickly trip and throw him. . . . We provide all these exercises for our youth my friend, in anticipation of a contest in arms, and from the fact that they have been thus fully trained we think that we have for our service better men." (Anacharsis, Rep. Com. of Ed., 1897-1898, I, 583-584; also Curtius, Hist. of Greece, II, 28.) The custom was no doubt made more permanent through the fact that these

exercises became associated with the worship of the gods. The steps by which this took place are thus described by Curtius, "As then the persons in the immediate service of the divinity, as the animals and the fruits of the earth which were offered up to the gods were each after its fashion, to be of blameless perfection, so too was the youth of the land when presenting itself to the gods in their honor joyously to enfold all its gifts of body and soul; while those marked out as the best were to receive the sacred wreath as a token of their worthiness to approach the gods in a pre-eminent degree." (Hist. of Greece, II, 27.)

The further back these musical and gymnastic exercises are traced the more intimate their connection seems to be. The manœuvres performed in honor of the gods were accompanied by music and poetry. Grasberger says that the dance at sacrifices in honor of the gods was an exercise from which developed the gymnastic training of youth, because an important influence upon the human heart was ascribed to just this union of poetry, music and dance. (Erz. u. Unt. III, 280). (See also Bosanquet, the Ed. of the Young in Plato, pp. 7-8.)

In conclusion it should be noted that each of the features of early Greek life which have been mentioned is related closely to some one of the schools named above. Thus the profession of the grammatist probably came into existence through a process of differentiation from that of the scribe, while the work of the music school was apparently a systematization and adaptation to the needs of the young, of instruction which was afforded in earlier times to the people as a whole by the poet and possibly by the rhaspody. And the work of the palaestra was similarly related to the military training and religious festival exercises of the more primitive Greeks.

General Features of Athenian Schools.

In entering upon a more detailed description of these elementary schools of the Athenians it is important to note that they seem to have occupied neither so large nor so definite a place in the social whole as at present. Girard (L'éd. Athen. 249) says, "It is probable that the Athenians did not carry into the organization of school work that vigorous attention to detail which the customs of modern life and our extended programmes of study require us to put into it. The school, moreover, was not a prison; one entered or left as he wished. In the time of Socrates it was, notwithstanding the prohibitions of Solon, a place frequented by men of all ages (Plato, Rivals 132A). The children came and went among the visitors whose conversation disturbed neither their work nor the instruction of the master. Their lesson recited, they left or continued to

study in the company of their comrades without being required to consecrate so many hours to gymnastic, so many to music and so many to literature.—As for vacations, there were none. —Their minds not being overwhelmed by study did not feel the need of recuperating as after continued and excessive labor."

The elementary schools were invariably private enterprises, receiving no financial support and practically no supervision from the State. As regards State supervision and regulation and as regards organization the work of these schools seems to have been about on the same level as the instruction in piano playing or dancing given to-day. Buildings and equipment varied, of course, according to the amount of fees paid by the patrons. School furniture as represented by vase-paintings consists chiefly of stools for pupils and assistants and a seat with a back, 'thronos,' for the master. Schools were open from dawn to dark (Girard, 249, Eschines against Timarchus 10). Boys of slave-holding families came accompanied by their attendants, the pedagogues. Sometimes the pupils met and marched in a body to the school. (Aristophanes, Clodds, 960-965.)

There were writing schools for even the poorest classes. Protagoras, in his early days, it is said, taught boys their letters in the street. (Diog. Lærtius X, IV.) Demosthenes (Crown, p. 54, (Bohn)) speaks of one Elpias keeping a reading school in the temple of Theseus.

Social Rank of the Teacher.

The teachers of these schools seem to have been regarded usually as of inferior social rank. "We ourselves," says Aristotle (Pol. 8, 5), "treat the professors of these arts (singing and playing) as mean people." Of one who was missing, the saying in Athens ran, "Either he is dead or has become schoolmaster." Lucian (Menippus 17, (Girard 242) represents kings and satraps in hell as despoiled of their riches and forced to maintain themselves by teaching reading and writing. Epicurus complains of Nausiphanes, "he abused me and called me a schoolmaster." (Diog. Lærtius X, IV.) Demosthenes in attacking Eschines repeats again and again the fact that his father was a schoolmaster and he is careful to emphasize the fact that he is only assistant and that in a school of the lowest order, a reading and writing school. (Demosthenes Orations (Bohn) pp. 54, 94, 194.)

Extent to which the Schools were Differentiated.

Some at least of the primary schools just referred to were evidently distinct from the music schools. This is indicated in

a passage in Plato (Charmides 160 A), "And is it not best to understand what is said whether at the writing master's or at the music master's or anywhere else . . . as quickly as possible?" Yet it is probable that instruction in letters and music were frequently given in the same building and occasionally even by the same teacher. (Girard 128.) Aristophanes (Knights 1235) writes as if intellectual education, grammatical and musical, was obtained in one place and physical training in another, "To what teacher's school did you go when a child? . . . What style of wrestling did you learn in the school of the gymnastic master?" On each side of the Douris cup is represented a teacher of letters and a teacher of music who is apparently one and the same individual.

Course of Study and Methods in the School of the Grammatist.

Pupils on first entering school took up the study of letters under the grammatist. The alphabetic method was followed. Fragments of a tile have been found in Attica on which are stamped the syllables, ar, bar, gar—; er, ber, ger, etc. (Girard 131 Philistor IV, 327.) The comic poet Callias wrote a letter play in which the dramatis personæ were the letters of the alphabet. (Athenæus, VII, 276.) It contained a spelling chorus which seems to have been a reminiscence of school experiences; beta, alpha, ba; gamma, alpha, ga; delta, alpha, da, etc. Similarly on the body of a bottle-shaped vase, around the foot of which was printed the alphabet, were the following letter combinations bibabube, gigaguge, zizazuze, mimamume, pipapupe, etc. Some authorities consider this a charm, others believe it to be one of the school exercises in pronunciation. (Grasberger, II, 267.)

The pupil learned to write by tracing and later copying the exercise set up for him by the master. Both wax tablets and papyrus were used as writing material. The art of calculation, hindered by their cumbersome system of notation, never attained among the Greeks a high degree of development. Yet the strong commercial bent of the Athenians necessitated some arithmetical training. "Boy—bring forth my tablets," says Strepsiades in Aristophanes' Clouds, "that I may read to how many I am indebted and calculate the interest." We have no direct evidence that arithmetic was taught in the Athenian elementary schools, but the emphasis laid upon it by such theorists as Plato make it probable that such was the case. (Grasberger, II, 322-323); Plato, Rep. 525 A; Laws, 819 B.)

As soon as the pupil had acquired some ability in understanding written words the teacher gave him verses to read selected from the best poets. The art of letters was apparently

so great an aid in the study of the national poetry that after the establishment of schools for reading, the teaching, at least of some of the non-lyrical poetry passed from the hands of the music teacher or citharist into those of the grammatist. Girard (p. 128) says, "The oldest, no doubt, was musical instruction which, in time, became complicated and to which was added reading and writing, then the intensive study of the poets in such a manner that literature was only an extension of music." Under these conditions it was natural that they should not be separated and that the same school should offer to both a common asylum." "When the boy has learned his letters," writes Plato (Protagoras 325-326), "and is beginning to understand what is written, as before he only understood what was spoken, they put into his hands the works of the great poets." The large place which poetry filled in the higher life of the Greeks has already been noted. On the Douris cup it is the teacher of poetry, who occupies the high-backed seat of honor, the 'thronos.' The scarcity and the high price of books, all of which, of course, were manuscript, necessitated methods different from those of the modern school. The pupils frequently made their own texts, copying from the dictation of the teacher. Much time and effort were devoted to the memorizing of poems and selections. Xenophon speaks of one who at school had memorized the whole of the Homeric poems. Those learned under the grammatist were often of a monitory character. "In these," continues Plato, "are contained many admonitions, many tales and praises and encomia of famous men which he is required to learn by heart."

In the selection of reading matter great freedom was exercised. Not only the great epic and didactic poems were used, but later also comedy, tragedy and prose. But of all, the poems of Homer were by far the most extensively used. The simplicity of the social and political life which they depicted, the rich variety of character, of incident and of emotional situations, the rarity of comment, the abundant references to the history, the geographical environment, the theology and folklore of the Greeks, and the poetic beauty of the whole gave these poems the first place in the curricula of the schools. Various passages show that their value was fully recognized by the Athenians. Plato in his Republic (606 E) speaks of "Eulogists of Homer declaring that he has been the educator of Hellas, and that he is profitable for education and for the ordering of human things and that you should take him up again and again and get to know him."

Among Greek as among modern teachers opinions differed as to the relative advantages of teaching a few entire poems or numerous selections. Collections similar to those in our mod-

ern readers were widely used. One of the most popular of these purported to be a selection made by Chiron for Achilles. Hesiod was believed to have put it into verse. A curious proof of its popularity is afforded by a painted Greek vase in the museum at Berlin which represents a boy reading from a half opened volume to two others who seem much interested. On a cubical coffer before the leader is another roll on which is written Chironeia and on the coffer beneath is the word 'kalē.'

Plato's Protagoras (326 A) tells us that the pupil read the books placed in his hands by the teacher sitting on a bench in school. The vase paintings, practically our only source of information on the subject, represent the pupils as reciting singly, standing erect before the teacher.

The Work of the Music School.

When the pupil had acquired some ability to read and write he took up, in addition to the study of literature under the grammatist, also the study of music with the citharist. The work of the primitive music school, as already noted, seems gradually to have differentiated into vocal and instrumental music on the one hand (the latter almost exclusively for purposes of accompaniment) and into the intensive study of poetry on the other. Thus where the duties of the grammatist and the citharist were performed by two different persons each seems to have taught literature. This is clearly what is stated in Plato (Prot. 325-326). "And when the boy has learned his letters and is beginning to understand what is written . . . . they put into his hands the work of the great poets, which he reads sitting on a bench at school. . . . Then again the teachers of the lyre take similar care that their young disciple is temperate and gets into no mischief; and when they have taught him the use of the lyre, they introduce him to the poems of other excellent poets, who are lyric poets; and these they set to music, and make their harmonies and rhythms quite familiar to the children's souls." The grammatist, apparently, taught literature in so far as it was read while the citharist taught the poetry which was usually sung.

Recalling what has already been said as to the importance attached by the Greeks to the content of their poetry it will be seen that its study under either teacher would involve that of other subjects of the modern school curriculum. The study of the second book of the Iliad would constitute, for instance, something of a course in geography. The whole poem was held by the Greeks to be a compendium of their history. Spartans and Athenians, for example, quoted precedents from Homer in their dispute with the Syracusans as to who should lead in the expedition against the Persians (Jebb, Homer, p.

85). Says Grasberger (III, 336): "Even a certain amount of scientific knowledge in geography and astronomy and especially the most important facts of history were imparted to the youthful mind in the schools of antiquity through the works of the poets."

Interesting light is thrown on the method of teaching instrumental and vocal music, by vase-paintings, particularly those on the Douris cup in the Berlin Antiquarium. Teacher and pupil, each with his lyre, sit facing each other, the former illustrating, the latter imitating and practicing. So also on the vase of Pistoxenos (see Girard, p. 120). In a painting on one of the London amphoræ (Girard, p. 111) the pupil is apparently accompanying the teacher who is singing. The words are naïvely pictured issuing from his lips.

The Training in the Palaestra.

As the pupils approached the period of adolescence they entered upon courses of physical training under the paedotribe in the palaestra. Plato after having sketched the Athenian boy's education with the grammatist and the citharist continues "*Then* they send him to the master of gymnastic, in order that their bodies may better minister to the virtuous mind and that they might not be compelled through bodily weakness to place the coward in war or on any other occasion." That systematic training in the palaestra came as a rule later than the work in the writing or music school is indicated also by the fact that in the vase-paintings the pupils of the former institutions are represented as older than those of the latter. "When they have allotted three years from the time of boyhood to the other parts of education" says Aristotle, "they are then of a proper age to submit to labor and a regulated diet. For it is impossible for the mind and the body both to labor at the same time." (Pol. VIII, IV.) The Palaestra were private institutions and were apparently frequently named after their proprietors (Girard, 28-29). Here the young Athenians were trained in running, wrestling, jumping and in throwing the discus and the javelin.

Centres of Educational Influence Outside of the School.

With the conclusion of the work in the palæstra the boy of the more aristocratic class passed from under the guardianship of the pedagogue and entered upon a course of systematic physical training in the gymnasium. His work in the music school having been concluded, such intellectual training as he received was derived from listening to the discussions of philosophers and others in the gymnasia and other public places,

from attendance at the theatre, the law courts, the assembly, and from other sources of educational influence in which Athens was peculiarly rich. Eschines in his oration against Ctesiphon (246) says, "It is not, men of Athens, you know it well, it is not the palaestra, the seminary or the study of liberal arts alone, which form and educate our youth. Of vastly greater value are the lessons taught by the honors publicly conferred!" Some of the sources of this extra-school education are referred to by Lucian (Anacharsis, Rep. Com. Ed., 1897-1898, 1, 582) "We instruct them thoroughly in the common laws. These laws we have transcribed in large letters and have set them up in public places for all to read. The inscriptions give orders concerning that which it is fitting and proper for young men to do and that from which they should abstain. Further we urge upon them to seek the companionship of the noblest and best men of the state from whom they learn to speak properly, to act justly. . . . We also assemble the young men in the theatre and by the influence of tragedy and comedy publicly train them to contemplate both the virtues and the vices of their ancestors that they may turn from the latter and may seek eagerly to emulate the former."

The New Education in the Elementary and Higher Schools.

During the 5th and 4th centuries changes were taking place in the political and social life of Athens which not only modified elementary education, but led to the development of a system of advanced education analogous to that of the modern university. The Athenian had been guided in his conduct by following social and religious tradition and the laws of the state. (Zeller, Pre-Soc. Phil., 1, 77.) The excitements of danger and of triumph in the Persian wars resulted not only in an intensifying of national consciousness, but in an increased consciousness of the worth of the individual. In individual and in corporate life men were guided less and less by tradition and more and more by their individual thoughts and desires. This affected school education as it did other features of social life. The traditional course of study was no longer so closely adhered to. Even during the 5th century changes had crept in which excited alarm and displeasure. Aristophanes in the Clouds compares unfavorably the newer with the older school music. "Their master would teach them, not sitting cross-legged, to learn by rote a song, either "Pallas Terrible Destroyer of Cities" or "The Shout Sounding Far," raising to a higher pitch the harmonies which our fathers transmitted to us. But if any one were to play the buffoon, or turn any quavers like these difficult turns the present artists make after the man-

ner of Phrynis, he used to be thrashed and beaten with many blows, as banishing the Muses." Nevertheless the modification of the existing course according to the felt needs of the time continued. By the middle of the 4th century drawing, geometry and the related sciences had been added to the reading, writing, literature and music of the old curriculum, while from the study of literature had branched off the subject of grammar, in the narrower sense of the term. (Girard, pp. 225-226.)

Another and much later result of this intellectual awakening was the organization of a more advanced education in the schools of philosophy and rhetoric, which later united to form institutions of higher learning, the so-called 'universities' of Athens, Rhodes and elsewhere.

The Schools of Philosophy.

Just as many to-day would fear the effect upon public and private morality of a general disbelief in a future life of retribution or reward, so many of the more thoughtful among the Athenians were alarmed at the growing disregard of the traditional safeguards of conduct. It was partly in an attempt to supply a substitute for these that Socrates inaugurated a new movement in philosophy. Truth, he believed, is a safe and sure guide to conduct. And this truth lies within the grasp of every man although it can be attained only through painstaking effort. A fruitful source of error and evil conduct has been that men have been too indolent to search out the truth and content to be guided by mere opinion. The truths that are a safe guide in conduct, he held, are those that apply not simply in particular instances, but in all cases. In other words, the most important truths are the general truths. The process of eliminating from our thought what was merely individual and accidental was facilitated through the mutual criticism of the dialogue. Hence with the general purpose in view of aiding others as well as himself he was apparently ready to discuss anywhere with any one any topic the discussion of which promised to contribute to the sifting out of truth from error.

His follower, Plato, on the other hand, arranged his teachings into something like a system and taught in a definite place, the academy. At his death his disciples constituted so organized a body that he was able to bequeath the headship over them to Speusippus, his nephew. Fees were collected by the latter, buildings were erected, classes organized and a definite school of philosophy, the Academy, came into existence. Similarly in the same city somewhat later, other schools of philosophy sprang up, the Peripatetic, the Stoic and the Epicurean, founded by Aristotle, Zeno and Epicurus, respectively.

These four schools together with those of the rhetoricians which will be discussed later and which in a similar manner seem to have become resident permanent institutions, formed the nucleus of what afterwards became under the Roman empire something like a great national university. For this reason and because one or the other of these philosophical systems influenced more or less directly the schoolwork of subsequent times (Jowett, Plato, II, p. 19; Oxford, 1892), mention will be made here of one or two of the characteristics of each.

Socrates' opinion as to the great importance of general ideas (Windelband, Hist. Anc. Phil., pp. 129) was such elaborated by his disciple, Plato, the founder of the Academic school. While the former held that the wholly true universally valid concepts could be found by merely culling, out from thought all that was individual and accidental, Plato, in his suggestive, semi-poetical manner (Jowett, *op. cit.*, II, 14), ascribes to them self-substantial separate reality. They are the true realities of which individual things are but the imperfect copies, and they existed before the latter. (Idea ante rem.) Being such they were to be attained not through the comparison and elimination of the qualities of individual things but through a process of speculative intuition (Windelband, 194).

To Aristotle, the founder of the Peripatetic school and the greatest and most influential of all ancient philosophers, truth was to be arrived at through the investigation of individual things. General concepts do not exist independently of individuals but in them. (Idea in re.) This question as to the relative reality of individuals or classes on which Plato and his pupil Aristotle differed became the centre of philosophical discussion during the scholastic period of the middle ages. Aristotle, in addition to many other philosophical and scientific achievements, summed up, supplemented and systematized the results of the labors of his predecessors in the art of arriving at the truth through reasoned argument in the new science of logic, his treatise on which has ever since remained the standard on that subject. Though the Peripatetic school waned after the death of its founder the writings of Aristotle have exerted a predominant influence upon the thought of succeeding times. To the mediæval scholastics he was the infallible authority on things worldly as were the Scriptures and the church on spiritual questions.

Of the remaining schools, the Stoic, founded by Zeno, was the most important both in its influence upon conduct and in its relation to non-professional education. In order that he might reach not merely the select few but the masses Zeno established himself not in the retirement of the groves of the Academy or the Lyceum as did Plato and Aristotle, respectively,

but in the 'Stoa Poikile' in the centre of the busy life of the city. The most eminent representative of Stoicism was Chrysippus, the third head of the school. To the Stoic the great end of life was virtue which he defined as living in conformity with nature or with natural law. (Windelband, 308 and 310.) The attainment of this end involved a course of study for in order to live in conformity with nature it was necessary first to learn to know nature through the study of physics. After we have acquired these facts about nature we must be able to use them in arriving at general truths or principles. The ability to do this is acquired in the study of logic. Finally we must learn through the study of ethics to apply these truths in matters of conduct. Like Socrates the Stoics found a source of wrong conduct in the workings of men's minds. Instead of their actions being controlled by the intellectual truths just referred to they were misdirected by the passions. Hence the wise man is he who ignores the emotions and is guided in his acts solely by his intellectual insight.

To Epicurus, the founder of the Epicurean school, the great end of life lay in the securing of happiness. True happiness, however, was to be found only in the practice of reflective insight, that is, of virtue.

The Sophists and the Schools of Rhetoric.

At the age of eighteen the young Athenians of all but the poorest class entered as ephebes upon the two years course in military training provided by the state. The frequent drills of this period, the marches to the frontier, the sojourn in camps and forts and the police and sentry duties still left the ephebes a good deal of leisure to profit by the educational opportunities which life in Athens afforded.

Owing to certain political and social changes, however, this unsystematized intellectual culture became inadequate. As membership in the legislative assembly was extended to all citizens and as the decision of disputes at law was handed over to one or another of the bodies of five hundred ordinary citizens (Cox. Gen. His. of Greece, p. 89), the young Athenians began to realize keenly the need of systematic training in the art of oratory and of debate. Hence when teachers appeared who professed to give this training their services were eagerly sought. They are known in our time as the sophists. Plato (Euthydemus, 272A) describes two sophists as "most skillful in legal warfare; they will plead themselves and teach others to speak and to compose speeches which will have an effect upon the courts." Again Plato represents the sophist Protagoras as saying of a young man ambitious of political preferment who sought instruction from the latter, "If he comes to

me he will learn that which he comes to learn. And this is prudence in affairs private as well as public; he will learn to order his own house in the best manner, and he will be able to speak and act in affairs of state." (Plato, Protagoras, 318D.) At first they gave only individual instruction chiefly in rhetoric (Zeller Pre-Soc. Phil., 1, 78) and dialectic, but gradually the number of subjects taught increased and their work was organized into that of definite institutions of learning, the rhetorical schools. The amalgamation of these schools of philosophy and rhetoric into an institution resembling somewhat a modern university, took place by slow stages and was consummated only after Athens had become incorporated in the Roman empire.

Unfortunately the organization of the schools of philosophy, while economizing the effort devoted to teaching and learning, seemed to restrict originality of thought. In the rhetorical schools less and less attention was paid to training to meet the demands of actual life, indeed with the political subjection of Athens to Macedonia in the 4th, and to Rome in the 2nd century the needs which had led to the establishment of these schools lost their urgency. The schools of philosophy turned from the original investigation of the great problems to the exposition of the views of their respective founders. The schools grew, however, in numbers. The same conquests which had cost Athens her political independence enormously widened the influence of her culture. "Out of the ruins of the Macedonian universal empire there grew up five monarchies in which Greek was the language of the court and the government, of inscriptions and coinage, and of the educated classes, and in some of which Grecian art, literature and learning reached a high development (Ploetz, Epitome of Universal Hist., 77). With the loss of military power and independence Athens clave the more closely to that which still was left, her position as the world's great centre of culture. With her freedom the age of great inspiration had passed away forever, but it was succeeded by an age only less brilliant of savants, of commentators, of rhetoricians and sophists. "These," says Petit de Julleville, "seemed to make their rendezvous at Athens from the extremities of the earth, attracted, no doubt, by her famous name, her glorious history; her boasted monuments and the memory still living of so many great men; but sensible also to the beauty of situation, the charm of climate, to the politeness of manners, to the pleasures of all kinds which this city, freed of ordinary business cares, offered to the prolonged leisure of its inhabitants." (L'école d'Athénes, p. 2.) With them came great numbers of students from many different foreign countries. Prominent among the student body were the

ephebes of Athens. This body had meanwhile been undergoing great changes. The political misfortunes of Athens had made it increasingly difficult for any but the wealthiest young men to devote two years to military training. As Athens sank into the position of a mere province the custom became of less and less practical importance. Hence the period was reduced from two years to one, later service was made entirely voluntary and the ephebic body became correspondingly few in number and aristocratic in character. Later still, foreigners, presumably of great wealth, were admitted. With the waning of the importance of Athens in world politics and the centring of the patriotic pride of her citizens upon her rank as a centre of learning, attendance at the famous schools came to be prescribed as part of the duties of the ephebic year. With the further development of the university, the ephebic body degenerated into something similar to a modern students' society.

The combination of the different schools into a single institution and the recognition of this as a great imperial university would naturally be furthered by the favor and support of the imperial government, especially during the reigns of Hadrian and the Antonines. The munificence of private patrons such as Herodes Atticus, no doubt contributed to the same end. After several periods of alternating decline and revival the university was finally closed in 529 A. D. by Justinian.

Résumé on the Schools of Athens.

The work of the Greek non-professional schools consisted essentially of an organization of educational influences and activities that had long been operating in the family and in the general social life of the people. The school did not supplant but merely supplemented the earlier educational institutions.

The centres of cultural influence in ancient Athens, and particularly during the 5th and 4th centuries B. C., were unusually numerous and powerful. The culture of the Greeks was to a greater extent native than is the case with that of modern civilized peoples of Western Europe and America. It was not associated with a foreign tongue. For these reasons the school was probably not even so essential a factor in education in Athens as it is in modern civilizations.

The schools of the Athenians did not have the elaborate organization of the modern public school. Those schools which gave more than elementary instruction in reading and writing were attended only by the children of a small proportion of the population.

Teachers, both elementary and secondary, seem to have been of inferior social rank.

The opinions of philosophical writers on education, such as

Plato, seem to have had little influence upon the work of the schools.

The two most powerful factors in determining the character of the course of study in the schools were, on the one hand, the tendency to give the child such instruction and training as would best adjust him to the social conditions amidst which he was to live, and, on the other, a tendency to be guided by tradition.

The preponderance of the latter resulted in the maintenance of the so-called 'old education.' The preponderance of the former during the period of intellectual awakening that followed the close of the Persian wars led to the growth of the 'new education.'

This free adaptation of school work to actual needs not only modified the course of study of the secondary schools, but brought into existence new educational institutions, the schools of the sophists.

II.

The Schools of Alexandria.

The conquests of Alexander disseminated the Greek civilization, which had reached its highest development in Athens, throughout much of Asia and Africa. As a result important centres of learning grew up in Pergamon, Rhodes, Alexandria and elsewhere. In Alexandria Greek culture underwent certain modifications which it is important for us to note in tracing the history of our non-professional schools.

The Conditions of Development. The cultural activities of this later Alexandrian period were strikingly different from those of the age of Pericles.

The difference was due to the decidedly different conditions under which they were carried on. The supreme achievements of the Athenians in art, literature and philosophy were the work of a free people. The poets and thinkers of Alexandria were under a despotism which made spontaneity of expression impossible. The poetry and art, science and philosophy of Athens were the product of impulses shared in by the mass of the citizens. In Alexandria culture was confined chiefly to a relatively small class for the most part foreign to the country and patronized by the court. The tone of life in Athens was determined by one race, the Athenians. In Alexandria Greeks stood with Jews and other oriental peoples on a similar footing. Finally some attach importance to the fact that the great Athenians lived in a region abounding in natural beauty, a feature wanting to the sandy shores on which Alexandria was built. Says Mahaffy, "But if as a commercial site Alexandria was unrivalled,

we cannot say much for its natural beauty. A sandy region, without wooding, without hills and a tideless sea, but with no far mountains or islands in sight—what could be more dreary to those accustomed to the enchanting views from the Greek and Asiatic coast towns? We know that the Greeks of classical days said little about the picturesque. Nevertheless its unconscious effect upon their poetry and upon other forms of art is clearly discernible, and perhaps not a little of the unpicturesqueness of Alexandrian culture is due to the absence of this vague but powerful influence. The grandeur of solemn mountains, the mystery of deep forests, the sweet homeliness of babbling streams, the scent of deep meadows and fragrant shrubs all this was familiar even to the city people of Hellenic days. . . . But the din and the dust of the new capital . . . . were only relieved by a few town parks and gymnasia. . . . . And, if there was retirement and leisure within the university, it was eminently the retirement among books—the natural home for pedants and grammarians." (Greek Life and Thought, 177-178.)

These conditions account for the fact that we find in Alexandrian literature, excepting perhaps Theocritus, little evidence of true poetic inspiration; the poetry is imitative and self-conscious.

The Alexandrian School and the Character of its Work. Of the elementary and secondary school work at Alexandria we have no record. It was probably of little importance for the mass of the people were non-Greek. The great influence of Alexandria upon the culture and school work of Rome and of later times was the result of the work of the members of a relatively small and exclusive body of scholars and writers, chiefly Greek, living and working under the patronage of the Ptolemies in a great institution of learning known as the Museum. The circumstances under which they worked were, as shown above, unfavorable to original literary or artistic achievement. Their most important contributions to literature are due to the attention they paid to the collection, arrangement and critical study of the great productions of the earlier Greek civilization.

The first Ptolemy, possibly at the suggestion of his friend, Demetrius, and influenced, perhaps, by the aims of his former master, Alexander the Great, founded a great library in which he collected the writings of the Greeks and of other civilized peoples. With this was connected later a corporation of learned men supported by royal endowment. "The Museum," says Strabo, "is a part of the palaces. It has a public hall and a place furnished with seats, and a large hall, in which the men of learning, who belong to the Museum, take their common meal. This community possessed also property in common;

and a priest, formerly appointed by the kings, but at present by Cæsar, presides over the Museum." (17, 8.) If, as some believe (for instance Mahaffy, Empire of the Ptolemies, 95), some of these took up the work of teaching, the whole institution would resemble somewhat a modern university. The bringing together of so many manuscripts containing varying versions of the works of classical authors led to great critical activity. Here were produced the first critical editions of Homer. Through this intensive study of classical literature the sciences of grammar and philology were brought to a high degree of development. Thus was formed a body of literary and grammatical erudition which constituted a large proportion of the material of instruction in the schools of Rome and of subsequent civilizations.

Of no less importance were the achievements of the Alexandrian scholars in pure mathematics and in the natural sciences. Here was completed Euclid's treatise on geometry used even up to the present as a school text. Here the science of algebra was developed by Diophantus, and here also important discoveries in mechanics, geography, astronomy and anatomy were made by Hero, Archimedes, Eratosthenes, Herophilos, and others. The scientific lore of the schools of Roman and later times owed, probably, its form and substance more to Alexandria than to any other ancient centre of culture. (Gow, Hist. of Math., 194-5.)

The peculiar culture conditions at Alexandria led, in the first and second centuries A. D., to its becoming the first great centre of higher Christian theological education. Here we find the greatest of those early Christian schools of theology, the successors of which throughout the greater part of the middle ages performed in society the function of the general, non-professional school.

III.

The Schools of Rome.

Although this elaboration of Greek culture which took place in Alexandria powerfully influenced the school work of later times, nevertheless the further history of the schools for the young, the development of which in Athens we have already noted, is to be traced out, not in Alexandria, but in Rome.

A narrow but powerful system of extra-school education and an elementary school for giving instruction, mainly in reading and writing and possibly calculation, had developed among the Romans, in the main, independently of the direct influence of the Greeks, though, of course, the Roman alphabet, among other things, was derived from early intercourse with the latter

race. A brief account of this education of the early Romans and of the conditions to which it owed its character will prepare us for the discussion of the secondary school education which they adopted from the Greeks.

Early Extra-School Education among the Romans.

Like the Greeks, the Romans dwelt upon a peninsula extending southward into the Mediterranean Sea. Unlike Greece, however, the country faced the west rather than the east. "The Italian peninsula," says Mommsen (Hist. of Rome, I, p. 7), "resembles the Grecian in the temperature and wholesome air that prevail on the hills of moderate height, and on the whole, also, in the valleys and plains. In the development of coast it is inferior; it wants, in particular, the island-studded sea which made the Hellenes a seafaring nation. Italy, on the other hand, excels its neighbor in the rich alluvial plains and the fertile and grassy mountain slopes, which are requisite for agriculture and the rearing of cattle. Like Greece, it is a noble land which calls forth and rewards the energies of man, opening up alike for restless adventure the way to distant lands and for quiet exertion modes of peaceful gain at home."

In several respects the national characteristics of the early Romans stand out in strong contrast to those of the Athenians. The heroes who figure in Roman folk-lore,—Regulus, Brutus, Horatius, Cincinnatus,—are embodiments of the ideals which to a greater or less degree moulded the lives of the early Romans. With them the sense of duty was as strong a motive to action as was the desire of pleasure with the Greeks, and this gave to the life and character of the old Roman a peculiar dignity. While the aspirations of the pleasure-loving Greek centered more and more about the individual, those of the Roman centered more in the family and the state. The intense, though silent, pride in family which prevailed among the Romans and its great educational significance are well reflected in their peculiar funeral customs. The masks of famous ancestors adorned the walls of the home. Upon the death of the head of the family, actors or others, each wearing the mask and the official robes of some ancestor, mounted chariots and joined the funeral procession to the forum. "There the corpse was placed in an upright position; the ancestors descended from their chariots and seated themselves in the curule chairs, and the son or the nearest gentile kinsman of the deceased ascended the rostrum in order to announce to the assembled multitude in simple recital the names and the deeds of each of the men sitting in a circle around him, and, last of all, those of him who had recently died." (Mommsen, Hist. Rome, III, 106.)

Within the household the father possessed sovereign power,

extending even to power of life and death over his children. The mother occupied a position of dignity in society. She was not, as among the Greeks, confined to the seclusion of the woman's apartments. As the husband was the master, so was the wife the mistress of the family. (Plut. Quaes. Rom. 30.) Her place was in the chief apartment of the house, where she sat directing the work of her servants. She appeared without fear in public. Everywhere she was treated with respect. (Jullien, Prof. de la Litt. 14.) Under such parents the Roman boy acquired discipline of manners, knowledge of the language, and the essentials of the historical and religious folk-lore of the race. He accompanied his father to the field, to the forum, to the house of a friend, to the public festivals and to the council hall. Here he acquired a knowledge of and a taste for those duties to family and country upon the successful performance of which were concentrated the energies of the early Romans. (Pliny, Letters, 8, 14.) The instruction was thus direct and practical. No thought was given to intellectual culture for its own sake. The Roman despised the luxury of the mind as he did that of the body. "The permanent intercommunion of life between father and son and the mutual reverence felt by adolescence for ripened manhood and by the mature man for the innocence of youth, lay at the root of the steadfastness of the domestic and political traditions, of the closeness of the family bond, and in general the grave earnestness (gravitas) and character of moral worth in Roman life." (Mommsen, I, 300.) Admirable as this method of education may seem, it is important to note that it made impossible the attainment of a high degree of culture.

Physical training was, of course, not neglected among a military people as were the Romans, but it was characteristically direct and practical in character. Practice with the sword and the javelin, in swimming and running, in wielding the axe and in bearing burdens was carried on not to develop symmetrically the body but to develop efficiency in war. Cicero, (Commonwealth IV, IV) says of Greek gymnastic training, "Among the Greeks on the contrary what an absurd system of training youth is exhibited in their gymnasia! What a frivolous preparation for the labors and hazards of war.!"

The Beginning of Elementary School Instruction Among the Romans. It was this strong practical sense that led the Roman to adopt at an early period the arts of reading, writing and calculation. The Roman books of oracles, the clan registers, and the Alban and Roman calendars are of great antiquity (Mommsen, I, 281). The story of Virginia and the custom of setting up in public places tablets of stone or brass on which were en-

graved laws or treaties seem to indicate that these fundamental arts had become subjects of general non-professional instruction in the 5th century B. C. Of the earliest stages of the instruction in these arts we have very little information. In these as in other matters the father seems at first to have been the instructor (Jullien 24, Cic. Commonwealth 2, 21, 37; Suet. Aug., 64). Roman education so far as we have sketched it is well summarized in the words which Cicero (Commonwealth, I, XXII) puts into the mouth of Scipio "Should not I, whose main business, according to the example of my father and my ancestors, is the advancement and right administration of government, be confessing myself more indolent than any common mechanic if I were to bestow on this noblest of sciences less attention and labor than they devote to their insignificant trades? . . . regard me as a true Roman, not illiberally instructed by the care of my father and inflamed with the desire of knowledge, even from my boyhood, but still even more familiar with domestic precepts and practices than the literature of books."

Probably the pressure of other duties led wealthy parents to hand over this work to an educated slave or freedman, and those of moderate means to send their children for this elementary instruction to the schools of the litterators. These were usually foreigners or freedmen of the lowest rank of society. The thrifty Cato let out his educated slaves for hire as teachers. The litterators seem to have derived only a miserable pittance from their labors. The Romans seem to have looked down with profounder disdain than did even the Athenians upon the salaried professions (Jullien, 27). Hence the teachers were supported at first by gifts. This custom did not die out even when fixed fees became the rule. This prejudice accounts for the fact that some teachers "never haggled about remuneration but generally left it to the liberality of their scholars." (Suet. Lives of Gram., VII.) Plutarch states (Quaest. Rom., 59), that the first school teacher to make a fixed charge was Spurius Carvilius, a freedman.

As among the Greeks the housing and equipment of the school varied with the wealth and station of the pupils. The houses of even the wealthy Romans were as a rule flanked on the ground floor by shops opening on the street. Sometimes these would project as a sort of porch (pergola) into the narrow street. Teachers frequently rented for school purposes such rooms as these (*cf.* the Pompeiian fresco, Suet. Lives of Gram., 18, 2; St. Aug. Conf., 1, 13). Hangings were used to separate the school from the stir and noise of the street. It was probably on account of their location in public places that they were called "trivial schools" (Ziegler, Geschichte d.

Päd., Absch. I, § 1): hence also the complaints as to the disturbance they created (Martial, 9, 68).

The Character of Roman Elementary School Instruction. There seems to have been no essential difference between the Roman and the Greek methods of teaching the elementary reading, writing and arithmetic which constituted the course of study in these schools. Dionysius of Halicarnassus, who spent twenty years of the first century B. C. in Rome, gives what is perhaps the clearest and most concise account of the method of teaching beginners to read. "When we learned to read was it not necessary at first to know the names of the letters, their shape, their value in syllables, their differences, then the words and their case, their quantity long or short, their accent and the rest? Arrived at this point we began to read and write, slowly at first and syllable by syllable. Some time afterwards, the forms being sufficiently engraved upon our memory, we read more cursorily, in the elementary book, then in all sorts of books, finally with incredible quickness and without making any mistake." (On the Arrangement of Words, ch. 25) (Quin, 1, 1, 24,-34.)

Aside from the Latin translation of the Odyssey the reading matter seems to have been largely monitory in character. As among the Greeks the pupils wrote as exercises in writing the texts used in reading (Marquardt, Privatleben d. Römer, 96; Quin., 1, 1, 34-36). The Laws of the Twelve Tables the use of which in the schools as stated by Cicero (Laws 2, 23) was so characteristic of the severe, practical Roman, were probably used in writing and reading exercises before being memorized. (Marquardt, Privatleben, 96.) Writing seems to have been taken up after the elements of reading had been mastered. A variety of devices were employed to aid the pupils in the first stages (Sen. Ep. 94, 51; Quin. 1, 1, 27). Quintilian recommends the use of grooves to guide the stylus of the beginner in forming the letters. Seneca refers to the practice, apparently common among teachers, of guiding the hands of their pupils.

The practical Romans attached much importance to the study of calculation. "The Roman youth," says Horace, "learn by long computation to subdivide a pound into a hundred parts. Let the son of Albinus tell me, if from five ounces one be subtracted what remains? He would have said the third of a pound—bravely done! you will be able to take care of your own affairs. An ounce is added; what will that be? Half a pound." (Art of Poetry, Bohn, 319.) The monotonous singsong of the arithmetical tables of which Augustine complains, "one and one are two, two and two are four," etc., had, no doubt,

come down from the earliest times. The clumsy notation of the Romans and their employment of two systems of numeration, the duodecimal for money and the decimal for everything else, made calculation more difficult and more dependent upon mechanical aids than with us. Calculations, as the history of the word shows, were carried on through the use of pebbles or similar objects. Horace mentions the bag of stones as part of the schoolboy's equipment. (Sat. I, 6, 74.) As is indicated in our use of the word 'digit,' the objects most frequently used were the fingers. They were used with great skill in even complicated operations. Eighteen positions of the left hand stood for the nine units and the nine tens (the Romans had no sign for zero). The corresponding positions of the right hand stood for the nine hundreds and the nine thousands, while 10,000 and larger numbers were expressed by touching various parts of the body. This finger reckoning was universal among the Romans and traces of it survive among modern Italians. The landlord or the merchant reckoned up with his fingers the bills of his patrons in the presence of the latter. The importance of calculation and universality of finger-reckoning are reflected in the following passage from Quintilian (Inst. of Rr., I, 10, 35): "Knowledge of numbers, assuredly, is necessary not only to the orator, but to every one who has been initiated even into the rudiments of learning. In pleading causes—the speaker, if he hesitates, I do not say about the amount of a calculation, but if he even betray, by any uncertain or awkward movement of his fingers, a want of confidence in his calculations, is thought to be but imperfectly accomplished in his art." Reckoning tables were also extensively used. Notwithstanding the difficulties of number work, it was in this that the Roman elementary schools seem to have been most successful. (Jullien, p. 23.) Advanced work in the subject could be taken up under a special teacher, the calculator. (Martial, X, 62, 4; C. I. L. V, 3384.)

The elementary school restricted its attention closely to the bare utilities, reading, writing and calculation. Knowledge of these subjects was more widely diffused among the Romans than is usually supposed. (Boissier, La Fin du Paganisme, I, 152.) For that higher culture that would fit him to share in the pursuits characteristic of highly civilized society the Roman youth turned to the grammar school or school of literature.

Development of Secondary Schools among the Romans.

The secondary school appeared among the Romans only comparatively late in their history. There was, indeed, no reason for its existence until there existed in Roman society some degree of that culture which it was designed to impart to the

young. "The science of literature," says Suetonius (Gram. I, 1), "was in ancient times far from being in vogue at Rome; indeed it was of little use in a rude state of society, when the people were engaged in constant wars and had not much time to bestow on the cultivation of the liberal arts." The striking thing about the Roman secondary school is that the culture, which conditioned its existence, was foreign; and this has remained true of the secondary schools of all nations which have appeared in the subsequent history of Western civilization.

The culture, the introduction of which made the secondary school necessary, was that of the Greeks. That branch of culture which first took root among the Romans was not Greek art nor religion nor language, though they were more or less acquainted with these. It was Greek literature.

The more immediate and special conditions which account for the rise of the Roman secondary school were various. In the first place, the increase of wealth and leisure among the Romans had created a need for a more advanced intellectual and æsthetic culture than their own crude art and literature afforded. About the middle of the third century B. C. Livius Andronicus, a freedman, born in the Greek territory south of Rome, but thoroughly familiar through long residence among the Romans with their life and character, began to present at their religious festivals translations of the Greek tragedies. The drama, though the form of Greek literature latest to develop, was admirably adapted to make a direct and powerful appeal to a comparatively uncultivated people. Later, Livius Andronicus translated from the Greek what would be to the Romans, perhaps, the most fascinating of all poems, the Odyssey. The interest thus aroused led to a desire to know Greek literature in the original, to the employment of Greek tutors and thence to the development of secondary schools for the study of Greek grammar and literature. Ennius, another Romanized Greek poet, supplemented the work of Livius. Both taught Greek (Festus, ed. Müller, 286) language and literature, but probably as tutors and not as regular schoolmasters (Jullien, 46-47).

At the same time this interest in Greek literature was being aroused in another way. Those Romans who found ability to speak and write Greek necessary in political, commercial or social intercourse employed Greek language-teachers known as "Grammatici." As these Greeks were accustomed to use literary masterpieces as texts the attention would naturally pass from the language to the literature. Thus from being teachers of language the grammatici tended to become teachers of literature or grammar, in the widest and then usual sense of the term.

Another reason which contributed to the growth of these schools and which powerfully influenced the character of their work was the growth of interest among the Romans in the study of oratory. The Romans had always attached a high value to the art of persuasive speech. Under their republican institutions the man whose eloquence could influence the minds of others was the man who possessed political power and power was the goal of the ambition of every true Roman. Oratorical skill was also as formerly in Athens an important safeguard to life and property. Cato, it is said, had to defend himself before the courts on fifty different occasions. The Greeks having felt this need for oratorical training much earlier had already produced a system of training to meet it. (Jullien, p. 53.)

At first this rhetorical training seems to have been given in Rome in the non-professional grammar schools (Sueton. Gram., IV). Later the work was differentiated, the important preparatory literary instruction being given in the grammar school while training in oratory was given in higher schools more professional in character, called schools of rhetoric. We have then in Rome in the 1st century B. C. a hierarchy of schools consisting of three classes, the elementary, the grammar, and the rhetoric school. It is to these three schools that Apuleius refers in Florides 20, "At a repast the first cup is for thirst, the second for joy, the third for pleasure, the fourth for folly. In the feasts of the Muses, on the contrary, the first cup is poured out for us by the literator (who teaches us to read); it begins to polish the rudeness of our minds; then comes the grammarian who adorns us with a variety of knowledge, finally the rhetor puts into our hands the weapon of eloquence." (Boissier, La Fin du Pag., I, 150.)

Among the complex conditions favoring the development of secondary schools among the Romans are, in brief:

1st. The introduction to the Romans of Greek literature upon the stage and through written translations.

2nd. The growing necessity in political, commercial and social circles of a speaking and writing knowledge of Greek.

3rd. The growth of interest in the science and art of oratory.

The literature studied in these schools, it should be noted, was Greek, the system of instruction was Greek, and the teachers were, at first, Greek. They were decidedly Greek schools. "But we," says Cicero, "who have all our learning from Greece, read and learn these works of theirs from our childhood; and look on this as a liberal and learned education." (Cic. Tusc. Disp., II, 11, 27.) The national pride, however, as well as the practical sense of the Romans led them soon to develop a system of literary and rhetorical training, modelled after that of the Greeks, but based

upon the study of their own somewhat meagre but rapidly developing literature. Thus side by side with the Greek there arose Latin schools which to a remarkable degree maintained an independent existence. They differed from the Greek schools not only in language but, as we should expect, in laying great emphasis upon the practical and less upon the theoretical part of the work. The situation was not unlike that which exists among us even to-day. We have schools which aim to impart a culture on the basis of the study of Latin, while other schools are organized in accordance with the belief that a more practical culture can be imparted with greater facility through the study of the literature of the mother tongue. So we have Latin high schools and English high schools. Similarly the Germans have their Gymnasia and their Realschulen, in the former of which the culture imparted is largely Græco-Roman, while in the latter the culture is that of the natural sciences and modern literatures.

The Character of Roman Secondary School Work.

The courses of the Latin and Greek schools were sufficiently alike, however, to be included in the same general description. In both the work consisted of an extensive and intensive study of literature. This was preceded by the study of grammar in our modern, narrower sense of the term. In both schools the knowledge and training thus acquired were made available for oratorical purposes through abundance of practice in writing and speaking. Some slight attention seems to have been paid to the sciences. The study of grammar was intended to cultivate correctness of speech. The study of literature, in so far as it dealt with form, would cultivate the student's sense of the beauties of literary style; in so far as it dealt with content it would develop that breadth of knowledge and of sentiment which is the necessary foundation of true elevation of thought and of language. The rhetorical exercises trained the pupil's powers of expression.

School instruction in these subjects became elaborately systematized at the hands successively of the Athenians, the Alexandrians and of the Romans themselves. So formal and elaborate was the procedure that it is impossible to examine it here in all its details. A few only of the most typical will be described.

Grammar. The work in grammar, using the word again in the restricted sense, began with the letters. They were divided into vowels and consonants and the latter again into semivowels and mutes. A comparison of the letters with the elementary sounds of the language then led up to the study of changes in the form of words. Did letters exist correspond-

ing to all the sounds of the language? For instance, was the second vowel sound of "optimus" correctly represented by 'i'? What letters had more than one sound? Instances of vowel changes in words were noted, in conjugation, as, 'fallo, fefelli;' in composition, as 'cadit, excidit,' etc. Attention was paid to the changes taking place with the lapse of time. 'Alexander' was compared with the form 'Alexanter' found on ancient monuments. Similarly, 'arbor, labor, vapor' were contrasted with the obsolete forms 'arbos, labos, vapos.' Words were classified as to their function, some following Aristotle's classification into verbs, nouns and conjunctions. Varro, an eminent Latin grammarian divided them into those that have case, those that have tense, those that have neither and those that have both. It was noted that some nouns feminine in form were masculine as 'Muraena,' some neuter in form were feminine, also that some verbs looked like nouns as 'fraudator,' that some were used only in the third person as 'licet, piget.' A large but poorly classified collection of facts like these was made.

Literature.

The study of grammar was followed by that of literature, the interpretation of the poets. The method was carefully elaborated and, notwithstanding a great variety of terminology, seems to have been in different schools essentially the same. (Jullien, 243.) It may be advantageously discussed under the following heads,—the reading, the comment, the correction, and the judgment.

Great importance was attached to *Reading* aloud. A Roman epitaph reads, "I have been grammarian and reader, but of those readers who please through the purity of their diction." Careful attention was paid to accent, quantity, pronunciation and also to expression. Many passages were memorized.

The purpose of the *Comment* was to furnish the student with apperceiving ideas and thus aid him to a more thorough appreciation of the poem. The life of the author, the circumstances of the composition of the poem, facts about persons, places and things mentioned in the text were among the points discussed. Quintilian probably has in mind the extensive knowledge which this part of the work demands of the teacher when he writes, "Nor is it sufficient to have read the poets only; every class of writers must be studied, not simply for matter, but for words, which often receive their authority from writers." (Inst. of Oratory, I, 4, 4.) Juvenal says that it was expected of the teacher that he should "read all histories, know all authors as well as his finger ends, that if questioned . . . he should be able to tell the name of Anchises' nurse, and

the name and native land of the stepmother of Anchemolus . . . also how many flagons of wine the Sicilian king gave to the Phrygians." (Sat., VII.)

The *Correction* dealt with the text and also with the style of the author. First there was the authenticity of the text. Is this the work as it was composed by the author? The authentic readings of the Greek writers had been quite carefully worked out by the Alexandrian scholars. Yet much trouble was caused in this age of manuscripts by careless copyists. Gellius tells of a scholar who, at great expense of time and money, hired a copy of Ennius said to have been corrected by Lampadio in order to assure himself whether the poet had written 'equus' or 'eques.' Is 'stetisses' or 'stitisses' the correct reading in Cato? Did Vergil write "Scopulo *infixit* acuto" or 'Inflixit?' But this correction did not confine itself to questions of authenticity. It boldly questioned the style of the poet himself. Quintilian suggests that the teacher should point out, "What words are barbarous or misapplied, or used contrary to the rules of the language." (Inst. of Orat., I, 8, 13.) For example, 'vexasse' was thought too weak a term in Vergil's line "Dulichias vexasse rates et gurgite in alto." (Ecl. VI, 76.) "Squalentem" does not harmonize in sense with the other words in "Per tunicam squalentem auro latius haurit apertum." (Enead X, 314.) Even Cicero should have used 'potestate' in the phrase "in praedonum fuisse potestatem sciatis." In the study of most poems such questions as the following would come up: 'Are these figures of speech legitimate? Are they well placed? Are they not too numerous?' Lively and even passionate controversies sometimes arose over these criticisms.

The study of an author was rounded out with the *Judgment*, that is the general estimate of an author. In this were involved a characterization of his style, a résumé of his chief merits and defects. Quintilian thought it the duty rather of the rhetor than of the grammaticus "to point out the beauties of authors, and if occasion ever present itself, their faults." (Inst. of Or., 2, 5, 5.) Book 10 of Quintilian's Institutes is devoted largely to appreciations of this sort. For instance, "Simonides, though in other respects of no very high genius, may be commended for a propriety of language and a pleasing kind of sweetness; but his chief excellence is in exciting pity so that some prefer him in that particular to all other writers of the kind." (Inst. of Or., 10, 1, 64.)

Rhetorical Exercises.

The school work of the Romans culminated in the rhetorical exercises in which the student was led to utilize the literary

and grammatical training he had received in the development of oratorical skill. There were two courses, an elementary and an advanced. It was a matter of dispute among the Romans as to whether certain of the preparatory steps in the rhetorical course should be given by the grammaticus or the rhetor. (Quin. Inst. of Or., 2, 1.) Suetonius states that some of the earliest grammatici gave to their students the whole of their rhetorical training. (Lives of Gram. IV.)

The elementary course given in the grammar school consisted first, of the narration by the pupils of short, simple stories, usually fables. This was followed by the paraphrasing of passages from the poets, sometimes close, sometimes free. "He who shall successfully perform this exercise," says Quintilian, "will be able to learn anything." "Let sentences, also," he continues, "and chriae, and ethologies be written by the learner, with the occasions of the sayings added according to the grammarians, because these depend upon reading. The nature of all these is similar, but their form different; because a sentence is a general proposition; ethology is confined to certain persons. Of chriae several sorts are specified: one similar to a sentence which is introduced with a simple statement 'He said' or 'He was accustomed to say;' another which includes its subject in an answer: 'He, being asked,' or 'When this remark was made to him replied;' a third, not unlike the second, commences 'When some one had' not 'said,' but 'done, something.' An exercise commonly connected with this was that of reconstructing the sentences so that the name of the person concerning whom the anecdote was told would occur in the different cases. (Quin. Inst., I, 9.)

The advanced preparatory course seems to have been given by the grammatici, although Quintilian contends that it should be given by the rhetor. It included a greater variety of exercises. The list given by Hermogenes is as follows: 1. Fables, freer renditions of these were expected than in the elementary course. 2. Stories differing from the preceding in being more probable, the characters being gods or men. 3. Chriae, which differed decidedly from the elementary exercise of the same name. It was a formal discussion of a thought attributed rightly or wrongly to some eminent man. The plan, as in most of the other exercises, had become conventional. The discussion opened with a eulogy of the author, then a paraphrase of the thought, thirdly, exposition of the thought, fourthly, investigation of the contrary, followed by comparison, illustration confirmation, the whole concluding with an exhortation.

4. The next exercise mentioned in Hermogenes' list is the

refutation or confirmation of a tale. The order of discussion was as follows:

(1) An invective against the author. If the tale were, for instance, that of Daphne the student would proceed to say that "The author has no respect for the gods and deserves none himself," etc., etc.

(2) The story. Daphne, born of a river god, and Terra, the earth, was beloved by Apollo, and being pursued, was changed into a tree, etc.

(3) The Refutation. (a) Impossibility. How could the child be nourished by the river and the earth? (b) Impropriety. How could a god experience love? (c) Inconsistency. How could a mortal outwit a god? (d) Uselessness. Why should the earth anger a god?

(4) Concluding invective. (Jullien, Chap. VIII.)

These illustrations will give a clearer idea of the exceedingly formal character of the work. The remaining exercises of the course will be mentioned briefly. They consisted of: 5. Commonplaces, invective against vices or praise of virtues. 6. Praise and Censure. This exercise differed from the preceding only in referring to particular individuals. 7. Comparison (a) of men as, Achilles and Hector, or (b), of virtues, as, justice and generosity. 8. Theses or general questions as, Should a man marry? Is country life to be preferred to city life?

Other Subjects. 'Grammar' occupied so large a space in the secondary school curriculum as to leave little room for anything else. The attention paid to the fine arts and the sciences was not on account of their culture value, but because of their utility. Music and dancing were prized only in so far as they gave ease and grace of manner to the orator. The former of these arts improved his voice. (Quin. I, 10, 22.) Instruction was given by special teachers and usually in the privacy of the home, for the practice of these arts elsewhere than in the time-honored religious ceremonies was not considered to comport with the dignity of a Roman citizen. Sculpture, as involving manual labor, was despised, and the art of painting was little cultivated.

The sciences were held in somewhat higher esteem, presumably because of their greater practical utility. Those studied in the secondary school course were included under the term 'geometry.' "Geometry," writes Quintilian (I, 10, 34), "is divided between numbers and figures." A little farther on (I, 10, 46), he continues, "Need I add that geometry raises itself still higher, so as even to ascertain the system of the world? When it demonstrates by calculations, the regular and appointed movements of the celestial bodies, we learn that, in that system, there is nothing unordained or fortuitous." Under

geometry, then, were included the sciences distinguished by us as arithmetic, geometry, geography and astronomy. The word 'geometry' retained, it will be noted, much of this breadth of meaning throughout the middle ages. The Romans, characteristically enough, limited the study of these subjects to their practical applications in everyday life. Cicero, in speaking of geometry, says, "We have reduced the limits of this science and we expect of it no other benefit than that of knowing how to measure or count." These subjects were studied only in the brief periods which could be spared during the school day from the all-important literary and rhetorical studies. Instruction was given by a special teacher, the 'geometer.' The rarity of mention of this teacher in Roman literature indicates that his position was a subordinate one. The arithmetic was a continuation of the work of the 'calculator.' The geometry (in the narrower sense) consisted chiefly in exercises in mensuration. The reason for this is given by Quintilian (I, 10, 36). "Knowledge of linear figures, too, is frequently required in causes; for law-suits occur concerning boundaries and measures." Even less attention was paid to the study of astronomy. Its chief practical application seems to have been in the construction of the calendar.

The Roman Schools of Rhetoric.

The emphasis laid upon oratorical training in the Roman grammar schools, and the reasons for it, have already been discussed. Every schoolboy, says Juvenal (Sat. X, 160), is ambitious of rivalling some day Tully or Demosthenes. Yet only a small proportion of the grammar school students were to become orators. Its function was to afford a liberal education such as the social life of the upper and middle classes demanded. (Jullien, Prof. d. Litt., 319.) The training of the school was oratorical because the orator had become the Roman ideal of the well educated man.

Those who entered fields of activity such as law or politics, which necessitated the actual practice of oratory, entered a school of rhetoric where they received a more specific training. We have already noticed that an efficient system of training in the art of oratory, that is, in rhetoric, was first introduced among the Romans by the Greeks (Suetonius, Rhet. I) who, for a considerable period, enjoyed practically a monopoly of the teaching of the subject. Interest in the subject increases until, in the first centuries of the Christian era, it overshadowed all other subjects in the schools of Greece and of Rome. The establishment of the empire and the seizure of absolute power by the emperors deprived the art of any real value in the field of politics, yet this did not affect the popularity of the subject

among the upper classes. From being pursued as a practical training for a profession, it came more and more to be cultivated as a fine art.

The work of the schools of rhetoric consisted very largely of exercises in declamation and debate. Procedure had become somewhat conventionalized and elaborate, resembling in this respect that of the grammar schools which we have described. In fact, the methods of the latter were derived largely from the former. Suetonius explains this (Lives of Gram., IV). "The early grammarians taught rhetoric also . . . whence it arose, I think, that in later times, although the two professions had then become distinct, the old custom was retained, or the grammarians introduced into their teaching some of the elements required for public speaking, such as the problem, the periphrasis, the choice of words, description of character, and so on." The narrow range of topics is satirized by Juvenal (Sat., 7). "Do you teach declamation? Oh what a heart of steel must Vectius have, when his numerous class kills cruel tyrants! For all that the boy has just conned over at his seat, he will stand up and spout—the same stale theme in the same sing-song. It is the reproduction of the cabbage that wears out the master's life."

The character of the rhetorical study among the Romans of the second century A. D. and the importance which they attached to it are reflected in the following incident related by Aulus Gellius:

"During the summer holidays, being desirous to retire from the heat of the city, I accompanied Antonius Julianus, the rhetorician, to Naples. There happened to be a young man of fortune, studying and exercising himself with his preceptors in order to plead causes at Rome and accomplish himself in Latin eloquence; this person entreated Julianus to hear him declaim. Julianus accordingly went to hear him and I attended him. The young man appeared; and, beginning an exordium with rather more arrogance and presumption than became his years, he demanded the subject of controversy to be proposed. There was with us a follower of Julianus, an ingenious and accomplished young man, who took offence that he should, in the presence of Julianus, dare to risk his reputation by the extreme peril of inconsiderate speaking. By way of trial, therefore, he proposed a controversy not very consistent which the Greeks call 'Aporos;' but which in Latin may not very improperly be called 'inexplicable.' (The question was 'Seven judges try a prisoner, the majority to decide. Three decide for death, two for banishment, and two for a fine.) The young man as soon as he heard this without at all considering the matter, or waiting to know what was to be proposed, began

with wonderful rapidity to assert I know not what principles upon this question, and to pour out expressions distorted from their meaning and a noisy torrent of high-sounding words. All his companions who were accustomed to hear him applauded him with noisy clamor. Julianus all this while was in the greatest perplexity, blushing with confusion. After he had gabbled out many thousands of sentences, we took our leave. His friends and acquaintances following Julianus, desired to know his opinion. 'Do not,' he replied, 'inquire my opinion, *without controversy* this young man is eloquent.' " The institution by Vespasian of the custom of paying the salaries of certain eminent professors of rhetoric from the public treasury (Suetonius, Vesp., 18), inaugurated a movement similar to that carried out in Athens by which the schools of rhetoric were organized into a state institution of higher learning.

The Romans desirous of a highly finished education rounded out their school careers with a year or two of study at the famous schools at Athens, Rhodes and elsewhere.

Encouragement and Support of Roman Schools by the State.

The schools of grammar and rhetoric that we have described gained a footing not only in Rome but throughout Italy and even in distant provinces such as Gaul, Spain and Africa. As in Athens, these schools were at first strictly private enterprises (Cicero, Commonwealth, IV, 3). But owing to different causes the encouragement and support given to the schools by the government and the upper classes rapidly increased. Custom prevented the aristocratic Roman from engaging in trade, and as the army became more and more mercenary, there was little attraction in a military career. The only promising field of activity left open to him was in the civil service of the state and the most direct way to preferment in this led through the schools of literature. On the other hand the state could not long overlook the services which these schools were rendering. They tended not only to make Roman subjects less barbarous and more lettered and hence more inclined toward peaceful and orderly lives (Boissier, Roman Africa, 240) but by revealing everywhere the same great literatures and by developing like tastes they created a bond of sympathy among the widely different peoples of the vast and almost unwieldy empire, which aided powerfully in the maintenance of its integrity. Agricola hastened to make permanent the incorporation of Britain in the empire by having the sons of the chiefs educated in the liberal arts (Tacitus Agricola, 21). No sooner were the Gauls conquered than Cæsar opened a school at Autun. Juvenal (Sat.

XV, 112) noted that even in the most distant regions young men were ambitious of becoming orators.

Even so early as the time of Julius Cæsar the state began to encourage and support the work of the schools. All teachers of the liberal arts were made free of the city "in order to fix them in it and induce others to settle there." (Suetonius, Jul. Cæs., 42). When Augustus on account of the threatened famine ordered out of the city large classes of the population, including foreigners, he made an exception in the case of physicians and teachers of the liberal sciences. (Sueton. Aug., 42). "Vespasian . . . . granted to the Latin and Greek professors of rhetoric the yearly stipend of 100,000 sesterces each out of the exchequer (Sueton. Vesp., 18). 'Antoninus Pius' bestowed salaries and honors upon rhetoricians and philosophers throughout all the provinces" (Jul. Capit. c., II). Alexander Severus gave fixed salaries to the rhetoricians, built lecture halls and ordered that scholarships should be given to students endowed with talent who were the sons of poor parrents. (Lampridius, c., 44.) In 321, 326, and 333 A. D., Constantine issued edicts conferring privileges and exemptions upon public teachers "by which they might the more easily instruct many in the liberal arts." The cities under the burden of oppressive taxation having become dilatory and parsimonious in the payment of teachers Gratian, in 376 A. D., fixed the salaries of the rhetoricians in Gaul at 28 and of the Grammarians at 12 annones. (Ozanam, Hist. of Civ., 192.)

During the first four or five centuries of the Christian era the school work in grammar and rhetoric remained practically unchanged except that it tended to become still more formal and conventional and still less adapted to the needs of practical life. (Boissier, La Fin du Paganisme, I, 192.) Tacitus had occasion to criticise this tendency as early as the 1st century. Referring to the rhetorical schools he wrote "As for their exercises they are ridiculous in their very nature. . . . . But, good gods! with what incredible absurdity are they composed. . . . Being taught to harangue in the most pompous diction on the rewards due to tyrannicides and other topics which are daily debated in the schools, and scarce ever in the forum; when they come before the real judges. . . . . (Dial. on Orat., 35.) The highly stereotyped character of the work of these schools was a cause as well as an effect of the sterility of thought and emotion and the exaggerated regard for mere form which characterize the literary activities of the 4th and 5th centuries.

In none of the Roman provinces did Roman culture flourish so vigorously as in Gaul. The schools at Treves, Autun, Clermont, Bordeaux, Poitiers, Toulouse and Narbonne were famous

and attracted students from even Rome itself. It was here that Roman culture longest survived in the disintegration of the empire, and it is here that the transition of instruction from the rhetorical and grammar schools to the theological school, of the church can be most clearly traced.

Résumé on Roman Schools.

For centuries after the Greeks had developed a system of liberal education, non-professional school work among the Romans was limited to instruction in reading, writing and calculation.

The higher culture of the later Romans was chiefly literary in character and was adopted from the Greeks.

Among the special causes leading to this were: 1, The introduction to the Romans of Greek literature through representations of translations of Greek plays through translation of Odyssey. 2, The study by the Romans of Greek as the international language of the time. 3, Growth of interest in the study of oratory, a system of training in which had been developed by the Greeks.

Though Greek culture was adopted by the Romans, it was strongly modified to adapt it to Roman ideals. Only those features were adopted which they could utilize in the attainment of the practical ends of life.

Among the Romans, as among the Greeks, interest centered more and more in the study of rhetoric. With the loss of political freedom it was studied in part as a professional preparation for the practice of law and in part as a fine art, as an end in itself.

Methods of school procedure among the Romans had become highly elaborated and conventionalized. The course of study was almost exclusively literary and rhetorical.

The teaching profession did not stand socially upon a high plane. The elementary teachers were frequently slaves or freedmen. Under the Republic and the Early Empire the social rank of even the secondary teachers was inferior. Their condition improved during the four or five centuries preceding the downfall of the Empire. Never, perhaps, has the teaching profession stood so high in the social scale as in certain Roman provinces, Gaul, Africa and the East, during the fourth and fifth centuries A. D.

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THE PEDAGOGY OF GEOGRAPHY.

By David Gibbs.

Introduction.

For more than a century geography has been an important subject of instruction in American schools. During this time it has been making larger and larger demands upon the time of the child in school. The older text-books were mainly lists of facts conventionally arranged. The facts were isolated and no attempt was made to secure unity. Association by contiguity and the verbal memory were the mental powers most exercised. Text-books on this plan and methods based on them still continue in use.

The spirit of evolution has more recently come into geography. To description explanation is added. The subject is now a natural science. The geographer now looks backward for causes and forward to results. This method requires a good store of facts from many sources. Recently, because pupils did not know these extra facts apart from geography, they have been included in the instruction. The result often is a greater confusion of the pupils and less accurate usable knowledge than when older methods were used. Undue emphasis has been given to physical geography and scientific method in the first grades, without much regard for the mental capacities of the children. While teaching geography as a science is now most emphasized, few teachers understand scientific methods, and after some attempts fall back upon easier methods. Most courses of study and most teachers follow the text-books. The text-book writers have been mainly mere compilers, without geographical or pedagogical training. They have little heeded the principles of education well known for centuries. They have attempted to shape the child to the material. For these and other reasons geography is to-day, perhaps, the most poorly taught subject in the curriculum of public instruction.

It is not surprising, therefore, that there is a general dissatisfaction with the present condition of the subject and a demand for its simplification and establishment on a more pedagogical basis. It is the purpose of this paper to aid in this improvement.

The general history of geographical text-books is first outlined, and followed by a historical review of the methods of teaching the subject. The methods in use in Europe and in the United States in the elementary and higher schools are reviewed. With facts so gathered and those derived from a number of special studies, a course of study for the elementary schools, together with the methods and text-books to be used, is developed and outlined according to the interests and mental development of the child.

I. A Historical Review of Geographical Text-Books.

If man is largely a product of his natural environment, including its geographical features, it is not surprising that geographical facts were among the first to receive attention in his writings. Geography is as old or older than history. From the time of Homer to the present, books written to express man's views of the universe, to relate his travels, and to describe the various countries and peoples of the earth, are almost innumerable. We shall consider here only those written mainly for school use and some of those early general geographies which formed the basis of later school text-books.

Three general periods of development, corresponding to the general development of civilization, are distinctly marked; viz., the ancient or Greek, the mediæval or speculative, and the modern or scientific.

An outline of the geography of the Greeks is important because it shaped geographical work in modern times and formed the basis of modern geography. Eratosthenes, the librarian of Alexandria, wrote what was perhaps the first general scientific treatise of geography in three books; viz., 1. A Review of the Progress of Geography. 2. Mathematical Geography, and 3. Descriptive Geography. He reconstructed and improved the map of the world, used parallels, meridians, and poles, established five zones, and with a gnomen measured with considerable accuracy the size of the earth. This work was an authority for two hundred years. (59, 89a.)

Strabo (66-24, B. C.) gave a systematic description of the world in seventeen books. He had travelled extensively, and had full command of the new knowledge gained by the extension of the Roman empire. He conceived the earth to be spherical, immovable, and surrounded by the heavens. He thought the habitable world formed a sort of cloak or mantle over the globe. His geography was very important, for from it Pliny gathered most of the facts about the universe which filled his volumes on geography, from which most of the materials of instruction in geometry and geography through the dark ages were gathered.

Greek geography reached its highest development in Ptolemy's work, written about 150 A. D. His system of astronomy commanded the world until long after being disproved by Copernicus, and his geography, translated and extended by the Arabs, was revived in Europe in the 15th century, when it formed the basis of a number of school geographies. The revival of the works of Strabo and Ptolemy was one of the important influences which brought about the great age of geographical discovery.

During this period Pomponius Mela wrote his "Chorographia," a work of three books. It was immensely popular during the middle ages. It consisted of a peculiar mixture of fact and fable.

During the centuries of the dark ages, trustworthy sources were forgotten, the fantastic and mythological were emphasized, and proved later to be most obstinate hindrances to scientific inquiry and geographical discovery. Nothing better represents the scientific barrenness of this period, its emphasis on idea rather than on fact, than the crude diagrammatical maps accepted by the best thinkers of the time.

The most notable books were "The Compilation of Marvels" by Solinus, and the religious cosmology of Cosmas. Solinus's book was taken mainly from Pliny and was composed largely of tales about birds, beasts, reptiles, etc. It was a great favorite during the middle ages. Cosmas's book was written to disprove the sphericity of the earth and to establish a biblical cosmography. He formed a complete system founded upon selected texts. During this period, too, travellers' tales were elaborated and popularized, and filled the common mind with a terror and ignorance of nature which was one of the prime causes of the isolation, poverty and barbarism of the middle ages.

During this period, geography was taught under geometry, one of the subjects of the quadrivium, which consisted of a few definitions of geometrical forms and an abridgement of Pliny's geography. (33-59.)

In 1524, Sebastian Munster published his "Geographia Universalis" which was founded upon Strabo, and Peter Appian, who used Ptolemy as his authority, wrote his "Cosmographia." These books held the field of Europe for more than a hundred years. In a few schools they were sometimes used as readers. (51-7.)

It was not, however, until the end of the sixteenth century that geography began to receive much attention in the schools. In 1582 Michael Meander published his "Orbis Terrae." It was a concise general description of the world (51-7) (58a-3). It was a step in advance because better adapted for school use. It was gladly taken up by schoolmasters and went through

many editions. It deserves the credit of being the first school text-book of geography of real value. It was used until the middle of the 17th century.

The next important book, "The Brief Questions from Old and New Geographies," was published by John Hübner in 1693. For many years Hübner's text-books on geography were used in Germany. Their method was adopted by other countries, and was used in a large number of school geographies until as late as 1890.

The following selection may serve as an example of Hübner's method:

1. "What is the position of Portugal?

As to Germany, it lies toward the west, and in its region it is the most western country of Europe. It is bounded on the west by the Atlantic Ocean and on the east by the Spanish provinces.

2. What are the rivers of Portugal?

The Duro above, the Tagus in the middle, and the Guadiana below.

3. What are the places in Portugal to be noticed?

Lisbon, the capital city of the whole kingdom and the residence of the king, lies at the mouth of the Tagus.

Evora lies inland, and is a good fortress.

Braga has the archbishop.

4. Is there anything else about Portugal which it is necessary to know?

The country is mountainous and has need of grain. The people are mainly merchants. They are Catholics, yet there are many Jews there. The whole country is ruled by one king." (58a-9.)

About 1670, Bernhard Varenius wrote his "Geographia Generalis" and founded modern physical geography with its emphasis upon causal relations and explanation of phenomena. Of this book Sir Isaac Newton said "It was a model of logical arrangement and terse statement,—a work of science and genius." (73a.) He treated mainly the physical and mathematical elements, and included reference to mankind only to catch the interest of the general reader. His plan was far in advance of his time, and he was the first to recognize the value of comparison as a method of study and the influence of relief, and systematically to trace the causes and effects of geographical phenomena. His method was adopted in general and given special application to human life by Kant in his lectures on physical geography in 1765. It was carried out to greater completeness by Humboldt in his "Kosmos" in 1845-58. Ritter combined the purely scientific view with that emphasizing man as the chief object of interest in the world. In his "Comparative Geography" he made the idea of comparison, so long before advocated by Varenius, important in the study of the earth as the home of man. The works of Humboldt and Ritter stand in relation to modern times in about the same position as did the works of Strabo and Ptolemy to the Greek period of civilization.

During the last hundred years text-books on geography have been too numerous to allow detailed description here. In general they fall into three classes in regard to their content or method; viz., 1. Texts covering special fields of geography, such as physical geography, commercial geography, anthropogeography, etc.; 2. General school geographies which develop the subject according to a conventional sequence; and 3. School texts which treat the subject more in accordance with the development of geographic forms. We can here consider only the last two classes.

Those texts which treat the subject according to its historic and conventional development usually begin with a definition of geography and of the different kinds of geography, and then take in order the earth as a whole, astronomical or mathematical geography, physical geography, and then in detail descriptions of the various continents and countries of the world according to a somewhat set outline. This general outline was developed by the Greek geographers and has been followed to the present time with very little change. It was represented by the first American school geography by Morse, published in 1774, and is now represented by Warren's and many similar geographies.

Jedediah Morse's "Geography Made Easy" was "an Abridgement of the American Universal Geography, containing Astronomical Geography, Discovery and General Description of America, General View of the United States of America, and of all the Kingdoms, States, and Republics of the known World." To this he added a chronological table beginning with the creation of the world and ending 1774. This book was used for many years and did much to secure the introduction of geography as a regular study into the schools.

Speaking of New England, Morse said: "Apples are common and cider constitutes the chief drink of the people."

Where can we find a more rhetorical description of the climate of the north Atlantic States than this? "The climate of this tract has but one steady trait, that it is uniformly variable. On the whole it appears that the climate is a compound of most of the climates of the world. It is the moisture of Ireland in the spring, the heat of Africa in the summer, the temperature of Italy in June, the sky of Egypt in autumn, the snow and cold of Norway in winter, the tempests of the West Indies in every season, and the variable winds of Great Britain in every month of the year."

Warren's geography was published in 1872. This geography and others similar are still widely used, and need no special description. The first part presents the outlines of mathematical and physical geography, and in the second part the various continents and countries are described in short condensed paragraphs according to a set order of topics; as, posi-

tion, size, outline, surface, drainage, climate, productions and animals, inhabitants, political divisions, government, religion, education, and history.

It is difficult to see where much progress has been made pedagogically, except in pictures and maps, in geographies of this type. Certainly Gordon's geography, published in England nearly three hundred years ago, is much more interesting than Warren's. The great increase of facts to be brought into the text-book has caused it to become more and more statistical. The primary geographies were simply the larger geographies still more condensed. It seemed decided that geographical facts could be presented only in this set order.

To make the dry facts of these geographies interesting the use of pictures and drawing were emphasized. Geographies in rhymes were often used, even in Greek and Roman times, and only a few decades ago our fathers remembered singing much of their geography.

The first book in America to adopt the principles of Humboldt and Ritter was "The Elements of Physical and Political Geography," written by Cornelius S. Carteé, of Boston, in 1856. He insists that "The learner must commence the study of geography by first learning the topography of the place where he lives, in other words he must begin at home."

"Avoid the use of technical terms and set definitions until the learner has attained to some knowledge of the facts and principles of personal observation as will serve him as a standpoint from which his imagination may venture to look out without fear of confusion." He recommends the use of relief maps, and begins his book with directions to teachers how and what to observe and teach in home geography, before placing the book into the hands of the pupil. The text is very readable. It takes up the facts of physical geography to develop the definitions of geographic forms before political geography. It proceeded inductively and was an excellent departure from the methods then and long after mostly in use. It contained about all the pedagogical principles that text-book writers have made use of in this subject up to the present time.

The principle of evolution and the value of the inductive method were long in becoming generally recognized by school masters. It was only in the 1890's the scientific method became prominent in our text-books. These books insist that the child in his first studies shall think inductively, and by thinking of the ditch by the roadside shall arrive at the idea of river valley, worn down highlands, and even peneplains. Children of the lower grades are expected to prattle about sunken coasts and elevated plains, understand mountain folding, the action of rivers, and the composition and formation of soils.

The inductive method does not admit of so concise statement as the deductive. It requires the use of a wider range of facts for illustration. The scientific geographer must use facts drawn from many sciences. The children do not know these facts. The geographer in order to preserve his method must present these facts also. The result has been the multiplication of an already many multiplied mass of facts. Further most of these geographers have been content to use their method for the introductory facts and definitions, but follow in general the old order of topics in the descriptions of countries. The result in many cases is a chaos in the mind of the child. At present some authors are beginning to inquire whether after all this forcing of scientific method upon the child is really pedagogically any improvement upon the older deductive method, which had at least the merit of clearness, and are turning to the child himself for guidance for the arrangement of the facts which are to lead him forward and appreciatively outward into this great world in which he lives.

The first geographies were cosmographies and the first school geographies were small cosmographies. They have remained such down to the present century. The use of the inductive method increased the size of the text-books, and also tended to the greater condensation of descriptive facts. It greatly increased the study of physical geography, and led to the introduction too early of inductive methods, to the exclusion of description. The attempt to make the beginning scientific and explanatory is questionably better adapted to the demands and abilities of the child in his earlier stages of growth. In the main school geographers have been neither skilled pedagogues nor persons with a wide acquaintance with nature. The old Greek geographers were all great travellers, and their works have comparatively not been surpassed. One new idea has been sufficient for a new series of text-books, and these new ideas are few and far between. No subject better than this shows how far, in the past, pedagogues have been content to remain behind the progress of science.

II. A Historical Review of the Methods of Teaching Geography.

The development of the teaching of a subject goes through the same general stages as the subject but may be far behind it in progress. Teaching is one of the most conservative of the arts. It is the last generally to accept and to absorb the principles established by the sciences. It may sometimes persist in going in the face of facts known to science and fundamental to its ultimate success. What is true of education in general is perhaps even more true of instruction in geography, the oldest

of all the sciences and in all ages the most comprehensive, yet taught for thousands of years with little or no regard for psychological laws or pedagogical methods, and often in the face of truth or scientific progress even in its own field.

We have seen that the text-books in use up to the present time follow the same general outline of procedure as that established by the Greek geographers two thousand years ago, and are but little improved. During the past century the methods of teaching geography, at least in theory, have, however, been in advance of the text-books. This is to be accounted for by the fact that the principles of the methods of teaching were established by great educational and scientific leaders, while the text-books have been written mainly by men who lacked scientific spirit, or pedagogical insight and training, or both.

We shall here sketch the growth of the theories and methods of geographical instruction from the Greeks to modern times, emphasizing the general lines of progress and the ideas of those educators and geographers who have done most directly to influence instruction in geography.

Strabo, the great Greek geographer, whose work is the first to come down to us, criticised the methods of the "ancient geographers" and emphasized the importance of observation and general orientation of the student of geography. He recommended the use of fables and myths to animate geography, and considered them to be a great stimulus to learning, especially if they included the marvellous.

"Man is eager after knowledge, and the love of legend is but a prelude thereto. . . . . A charm hangs round whatever is new and hitherto unknown, inspiring us with a desire to become acquainted with it, and when the wonderful and the marvellous are likewise present, our delight is increased until it becomes a philtre of study. To children we are obliged to hold out such inducements in order that in riper years, when the mind is powerful and no longer needs such stimulants, it may be prepared to enter the study of actual realities." (85, I, 29; 51-5.)

His emphasis on observation and scientific treatment was forgotten, but his myths and tales, instead of being used to stimulate children, were taken for facts by adults through the superstitious, submissive, introspective dark ages until the great geographical discoveries fully awakened western Europe.

In this Greek period we have also developed two general modes of procedure, the historic and the scientific, in the investigation and the teaching of geographical facts. On the one hand there were those who, being exact and methodical in thought, supplied, through astronomy and geometry, ideas of the form and size of the earth, who measured the land masses, established longitude and latitude, and investigated the forms of relief with their causes and influences, according as far as

possible to the methods of exact science. (89a-16.) Eratosthenes and Ptolemy belong to this class. This method was revived in Europe only with the translation of Ptolemy's geography in the 15th century. It was given a distinctly modern turn by Varenius in the 17th century and carried to completeness by Humboldt and modern scientific geographers.

On the other hand, others were more humanistic, who, though interested in geography, often used it mainly as an aid in the study of history and anthropology. Herodotus, "the father of history," recognized the connection of geography and history. The great Greek historian, Thucydides, used geography to illustrate history. Strabo in general emphasized this side of geography. He tried to correlate the conditions of the land with the conditions of the people, and to show how the former had aided or hindered progress. (89a-17.)

For the next two thousand years geography was subordinate to history. Even to-day, in the larger number of the higher schools of Europe, geography belongs to the chair of philosophy and arts, and is usually taught by a teacher of history. Herder called history "the geography of a particular period and people set into motion." (51-60 .) Kant claimed geography to be the basis of history. Ritter made man the centre of all geographical study as theologically man was of the universe. To-day the most common definition of geography is "the study of the earth as the home of man." Instruction in geography during the past century has fluctuated between these two general phases of geographical study, which have had very great influence on both its method and its content.

During the dark ages and until the books of Strabo and Ptolemy were translated in the fifteenth century, geography was commonly taught in the schools under Geometry. Some idea of the content and method is given by Alcuin in the following:

> "Anon the master turns his gaze on high
> To view the travailing sun and moon, the sky
> In order turning, with its planets seven
> And starry hosts that keep the heaven.
>
> The storms at sea, the earthquake's shock, the race
> Of men and beasts, the flying fowl they trace;
> Or the laws of numbers bend their mind
> And search till Easter's annual day they find!" (89b-32, 35.)

The discoveries of Copernicus and Galileo and the voyages of Columbus and Magellan did much to awaken inquiry and stimulate observation of nature. Bacon did much to make investigation systematic and inductive. Rabelais was one of the first to direct his pupils to the study of geographical facts by direct observation.

Rabelais admonished his pupil as follows: "As for knowledge of the works of nature, I would have thee devote thyself to them so that there is no sea, river, or spring of which thou knowest not the fishes; all the birds of the air, all the trees of the forest or orchard, all the herbs of the field, all the metals hid in the bowels of the earth, all the precious metals in the East and the South; let nothing be unknown to thee." (78a-68.)

Comenius reflected and applied the principles of Bacon to the selection, arrangement of materials; and the methods of teaching. He demanded that instruction begin with sense perception, the observation of things, and the study of nature. He is the father of "Home Geography." He was the first to make the knowledge of the home, gained by personal observation, the basis of the study of the country and of the world. Much that was demanded by Comenius for primary instruction in geography is still being demanded to-day. He was the first to recognize the importance of geography as a school study, and it is partly due to his influence that Germany has given this subject a prominent place in her schools and universities. (51-157.)

"The elements of geography will begin during the course of the first year, when children begin to distinguish their cradles and the maternal bosom. In the second year the geography will be to know the place where they are nursed, etc., in which they ought to know the place where they are nursed, when to go to rest, or when to go out, where the light is and where the heat is to be found.

In the third year they will advance in geography when they remember the distinctions and names not only of the nursery, but also of the hall, the kitchen, the bed room, of things in the house, in the stable, in the orchard, and in and around the home.

In the fourth they may, by going abroad, learn the way through the street or market place by going to the suburbs, to their uncle, their aunt, or their cousin.

In the fifth and sixth years they may fix all such things in the memory and learn to understand what a city is, what a village, what a field, what a garden, what a forest, what a river, etc. (74-39.)

In the vernacular school the pupils "should learn the most important facts of cosmography, such as the spherical shape of the heavens, the globular shape of the earth suspended in their midst, the tides of the ocean, the shapes of the seas, the courses of the rivers, the principal divisions of the earth, and the chief kingdoms of Europe, and in particular, the cities, mountains, rivers and other remarkable features of their own country." (31.)

Locke regarded geography as the science of observation, and urged the use of globes and maps, combining progressively geography with arithmetic and geometry. (64-156.)

He would begin with "learning the Figure of the Globe, the Situation and Boundaries of the four Parts of the World, and that of the particular Kingdoms and Countries,—being only an Exercise of the Eyes and Memory, a Child with Pleasure will learn and retain them. And this is so certain that I now live in a House with a Child whom his Mother has so well instructed in this way in Geography that he

knew the Limits of the four Parts of the World, could readily point, being ask'd, to any Country on the Globe, or any County in the Map of England; knew all the great Rivers, Promontories, Straits, and Bays in the World, and could find the Longitude and Latitude of any Place, before he was six Years old. These things that he will thus learn by Sight and have in his Memory, are not all, I confess, that he is to learn on the Globes. But yet it is a good Step and Preparation to it, and will make the Remainder much easier when his Judgment is grown ripe enough for it."

Locke, although emphasizing observation, meant the observation of maps and globes and not of nature. His method is the opposite of that recommended by Comenius. Locke begins with the study of the earth as a whole, of globes and maps, and finally of the home country. This is called the analytical method. Comenius used the synthetical method, beginning with the familiar and gradually, through widening spheres of experience, leading the child to the distant and unknown. The analytical method follows the lines of the logical development of the subject, placing the mathematical and physical before the descriptive. It is the method followed by the ancient geographers, and by nearly all writers of geographical text-books up to the present time. Its arrangement of topics takes little account of the pedagogical order and psychological difficulties of teaching. On the other hand, the synthetical method attempts to arrange the materials according to the interests and mental capacity of the child, leading the pupil forward on the basis of his own experience. Rousseau, Pestalozzi, Froebel, Ritter, Diesterweg, and others follow this line of development, which is more in accord with the genetic development of the mind of the child.

Francke, in the padagogium of Glaucha in 1702, made geography an independent study. He was the first to take pupils on excursions, although they were not wholly for the study of geography. On clear evenings the pupils were taken out to observe the stars. He used Hubner's "School Atlas" and "Questions" as text-books because they were written in German. He also combined geographical instruction with the reading of news, requiring the pupils to find on the maps the various places mentioned.

The rules of the Waldeck School, founded by Francke in 1704, contain the following: "Geography shall not be postponed until the highest class, but shall be taught in the lowest classes to make a beginning, because it is a pleasant study and a matter of memory; also, as experience has shown, it can be comprehended somewhat even by children six years of age. It will, however, be wise to proceed in this manner that the pupils be not themselves required to read a geographical book, but allowed only to see the maps, and to be shown thereon one part of the world after another and the countries and cities therein represented. The teacher, however, may use the book for himself." (51-23.)

Francke insisted on these principles in all geographical instruction: 1. Above all, Non multa, sed multum; 2. The pupil must know the political divisions first; 3. The pupil must learn the names of places, repeat them in series, and find them on the map, the teacher must give the Latin names and the points of interest; 4. Next the boundaries, rivers, chief districts, and cities must be studied; 5. Finally, "That which belongs to the consideration of the historical, political, ecclesiastical, and physical can, even in the largest kingdoms, be completed in a single hour;" The methods of Glaucha and Waldeck became examples for most of the schools of Germany. (58a, II-2.)

Francke's method of learning lists of names and copying maps was strongly condemned by *Rousseau*, who emphasized beginning by observation of the home surroundings. (79, III-257.)

"I assert that no ten-yeàr-old child, who has had two years of instruction in geography, can find, by the rules given him, the way from Paris to St. Denis; indeed, that he could not in his father's garden find his way about according to a plan without making a mistake; and these are the scholars who know to a hair where are Pekin, Ispahan, Mexico, and all the lands of the earth."

Rather "Let the child see the rivulet, the little lake or pond, the little hill or meadow, and then let these products of observation be developed by the help of the imagination, into rivers and lakes, mountains and prairies."

"Geographical instruction should begin with the house and the place of abode. The pupil should draw maps of the neighborhood to learn how they are made and what they show."

"For Émile the first two points of geography shall be the city where he lives and the country residence of his father, then the intermediate places, and the river of the vicinity." (Émile, Bk. II.)

Basedow followed out and put into practice these ideas of Rousseau. In his "Elementary Book" he said "It is practical to begin with a sketch of a room, a house, a town, and a well-known neighborhood, and then to go to a map of a country and so on to a continent." He wished all the senses to be exercised. He greatly favored illustration by maps, pictures, models, and products. He had a school museum for these things. He constructed two hemispheres in a field so large that pupils could walk on them. He was also a pioneer in illustrating geographical text-books. His books, which contained one hundred copper plates, were the first illustrated text-books for use of classes in geography, and have been called the "Orbis Pictus" of the 18th century. These books also contained numerous copper plate maps. (25, V-413; 51-15, 32.)

The text-books were supplemented by the teacher's reading accounts of journeys, by newspaper reading, by taking imaginary journeys. The pupils were not required to memorize

lists of names, because in these various ways they received sufficient drill. Basedow also emphasized the relation of human activities to geographical surroundings. He put an anthropological impulse into geography which later through Ritter, Guyot, and others has become so important in all geographical instruction and research.

Salzman, the most important follower of Basedow strongly condemned the study of distant countries before the pupil could think clearly in the terms of the geographical factors in his neighborhood. Otherwise the instruction has no foundation and may be worse than nothing.

"The prattling of a child, who has no clear idea of the natural and political conditions of his province, about the Carpathian Mountains or the forms of government in France or China, is nothing more than the babbling of a goat, or even worse, for the goat scarcely thinks of anything, while the child is thinking something wholly false." (51-38.)

Pestalozzi founded his teaching of geography on the ideas expressed by Rousseau. Like Basedow he tried to teach together geography and the study of nature. His principle, that all knowledge is based on observation, led him to emphasize home geography. He was the first progressively to teach children home geography by excursions. He thought that experience from self-activity in a limited field is necessary to comprehend the more distant parts of the earth. (51-157.)

In practice, however, Pestalozzi's method was often much like that of Francke. He spoke the names of cities, rivers, countries, etc., in series to his pupils, who repeated them in chorus. In this way, like Locke, he wished the child to learn these facts at an early age before seeking in each name all its relations. He considered this work only a kind of preparation and began the real study of geography by taking the pupils to different places in the valley at Yverdun, and finally having them reproduce the valley in clay.

Pestalozzi, however imperfect his methods in practice, was in geography as in other subjects the great inspirer. Besides many others it is of special note that he was directly the inspirer of *Froebel* and of *Ritter*. Both visited Pestalozzi at Yverdun. Froebel returned to apply his principles to his own classes at Frankfurt, bringing geography into the life interests of his pupils, making it a real educational force, intellectually and morally, and receiving from his experience a fund of ideas which formed the basis and the inspiration of all his later teachings on methods. Ritter learned Pestalozzi's method and promised to apply it to geography. The result was his "Comparative Geography," which may be said to have founded a new science, changing geography from a chaos of facts to an organized whole, giving it life and purpose.

Ritter said of Pestalozzi at Yverdun: "I have watched the growth of this precious plant. I have even drunk of the waters and breathed the air that give it life. I have learned to understand this 'method,' which, based on the nature of the child, develops so naturally and so freely. It is for me now to apply it to the domain of geography, where nature has been too long neglected. I left Yverdun fully determined to keep my promise I made to Pestalozzi of introducing his method into the study of geography, and already I am reducing chaos to order."

"Pestalozzi knew less geography than a child in one of our primary schools, yet it was from him that I gained my chief knowledge of this science, for it was in listening to him that I first conceived the idea of a natural method. It was he who opened the way to me, and I take pleasure in attributing to him whatever value my work may possess." (39a,-263.)

Froebel, writing of his teaching geography at Frankfurt, after visiting Pestalozzi, said: "I turned these occasions [of excursions once a week] to profit by leading on my boys to think for themselves: and to apprehend the relations of the various parts of the earth's surface. On these and other perceptions gained in this way, I based my instruction in physiography, making them my points of departure.

"The town was first my starting point and my centre. From this I extended out observations to the right and to the left, on this side and on that. I took the river Main as a base line just as it lay; or I used a line of hills or the distant mountains. I settled firmly the four quarters of the compass. In everything I followed the lead of nature herself, and with the data so obtained I worked out a representation of the place from direct observation, and on a reduced scale in some level spot of ground, as a sandy tract carefully chosen for the purpose. When my representation, or map, was thoroughly understood and well impressed on every one's mind, then we reconstructed it in school on the blackboard placed horizontally.

"This map was first sketched by pupils and teacher together, and then each pupil had to do it by himself as an exercise. . . . . My boys were as well acquainted with their surroundings of the town as with their own rooms at home, and gave rapid and striking answers as to all the natural peculiarities of the neighborhood.

"This course was the fountain head of all the teaching methods, which I afterwards thoroughly worked out and have now been in use many years." (45a,-55, 60.)

Two other writers and teachers of this time, *Frederick Gedike*, principal of a gymnasium in Berlin, and *Johann G. Herder*, of the Weimar gymnasium, did much to improve the teaching of geography. Gedike's main service was to adapt the teaching of geography to the age of the child. He argued against the logical order and directed the teacher to follow the order of nature as related to the developing mind of the child.

Herder thought the study of geography one of the most important for useful knowledge as well as for culture and elevation of soul. He insisted that the subject is full of life. He said "Talk of geography being dry! You might as well talk of the ocean's being dry."

He held that geography and natural history are inseparable, and that natural history may be the most useful kind of geog-

raphy. He was one of the first to consider the child's natural interests as important in instruction in geography. By means of the facts naturally interesting to the child he aimed to impress the chief characteristics of each country or climatic division. (51-47.)

"The elephant and the tiger, the crocodile and the walrus interest the child far more than the eight electors of the holy Roman empire in their ermine bonnets and coats. Through natural history each land, sea, island, climate, race, continent, is shown to him in indelible characters, the more so because these characters are unchanging and not connected with the name of some dead administrator.

"The Egyptian horse, the Arabian camel, the Indian elephant, the African lion, the American bison, etc., are more memorable symbols of a country than all the variable boundaries, which some delusive peace draws and the first war perhaps changes." (51-57, 58.)

In his first class in geography Herder confined the study to the important animals, plants, other important products, and the customs of the people in the different continents. In the second year this was continued with some reference to political geography and especially the geography of Germany.

Home geography was worked out to its present completeness by *Finger*, *Matzat*, and *Diesterweg*. They considered the study of geographical phenomena in the home district as psychologically necessary for map reading and the correct formation of ideas of distant places. It makes geographical description more real, vivid, and intelligible. Matzat thought the reading of maps of most importance in all geographical instruction. Diesterweg had great influence in Germany upon the development of present methods. He proved the value of home geography and popularized it. In him culminated that emphasis on beginning geographical instruction by observation of local features. (51-160.)

The 18th century was a time of wide observation, exploration, and the collecting of vast masses of facts belonging to many sciences. In this growth no other branch of learning had become as enriched as geography. The facts were, however, unrelated and uncorrelated. In 1765 *Immanuel Kant* first systematized geography. *Blumenbach*, in 1775, laid the foundation of anthropo-geography, emphasized later by *Ritter*, and more recently by *Ratzel* and others. *Zimmerman*, in 1778, established the outlines of zoo-geography. *Humboldt*, in 1805, wrote his plant geography, prepared the first vertical profiles, introduced the comparative study of elevations, established isotherms and heat zones, and in his Cosmos arranged facts according to their scientific relations. Ritter, inspired by Pestalozzi and profiting by the work of Humboldt, wrote his Erdkunde and his Comparative Geography. (51-160, 3; 58a; 89a-22; 18-No. I, No. 2.) In the preface to his volume on Europe he

wrote, in 1804, "From this desolate heap of particles an organic, life-like whole must be developed, which corresponds to reality; from the tedious because thoughtless description of the earth must arise a knowledge of the earth ; *i. e.*, a science which investigates causal connections and enlivens intellect and imagination. Geography must virtually become a science." Ritter's ideas were followed out by many educators and geographers, among whom especially *Peschel*, in Germany, emphasized comparative geography and physical geography, and *Guyot*, in America, gave new methods and new life to the teaching of geography in this country. (52-16.)

Since the days of Humboldt, Ritter, Guyot, and Peschel a most potent idea has taken hold on the scientific world, acting as a great unifying force; viz., the evolution theory. The development of the earth from particles in space to the cooling sphere, of the forms of relief upon its surface, and of the multitudes of forms of life, all struggling towards higher and higher forms of perfection culminating in man, has given to geography a scope, a scientific completeness, and a philosophical dignity which it never before possessed. It reversed the idea of Ritter that God had especially created the environment of man in every detail to fit his needs, and that one of the great purposes of geography was to point out how well God had done his work. The evolution theory has substituted for teleological explanation that of morphology of form, of response to the influence of environment. It has led to the perfection of the scientific method, which looks backward to the causes and successively forward to the results of the facts under investigation.

This method has now been generally adopted in the courses of study, the statements of methods, in text-books, and in teaching geography generally in the various grades of school. It is no doubt the proper method to use at certain stages of the work, but it has gradually been pushed down into the grades until we now have eight-year-old children being required to infer from the action of a little stream actually observed or seen only in pictures, the destruction of mountains, the formation of peneplains, and the consequent effects upon the inhabtants thereof. It requires a child to think and reason in terms of adult reason, when he has neither the materials nor the power to reason. It is a kind of reasoning into which we can well afford to wait for the child to grow. The development of the child, as in the development of the race, and the very nature of the scientific method require that it be used only after the accumulation of a good body of facts. The histories of our natural sciences show this. The results of modern child-study also show that the child in these first years of school life

is in an accumulating rather than a reasoning stage. Our scientific geographers to-day err as much in trying to make the first work in their subject with little children scientific as did those teachers two hundred and less years ago who insisted on following from the first the logical development of the subject.

Two other methods of importance deserve mention; viz., the topical method and the method by types. *Ziller*, one of the followers of Herbart, developed the topical method because of its correlating value, and also because it requires greater preparation on the part of the teacher, secures greater interest, and stimulates the self-activity of the pupil. This method is now in common use. It has aided greatly to give instruction in this subject more unity. The method by types is an extension of the topical method. It tries to group geographical facts about the study of a few type forms, which may serve as keys to the whole. (69.) This is a valuable method. It admits of wide application and is being satisfactorily used. The wide, intelligent application of a type form as a means of explanation, however, requires a good knowledge of the regions to be explained as well as of the type itself, so that this method seems best adapted only to the later stages of geographical study.

Besides these general methods many devices have been used to enliven the long lists of dry facts to be memorized. Geographical games, dissected maps, and play maps have been much used in Europe. Some writers have tried to make their books interesting by introducing rhymes, songs, or humorous outline maps for drawing, suggestive of the maps of various countries.

Summary. 1. We find that from the first historical records of the teaching of geography, except during the dark ages, observation has been considered fundamental. It was emphasized by Strabo, and again by Bacon, Comenius, Rousseau, Pestalozzi, Froebel, and all important teachers of geography during the past century. It is to-day recognized to be psychologically and pedagogically fundamental.

2. Emphasis upon observation and sense perception led Comenius first, and later Rousseau, Pestalozzi, Ritter, Diesterweg, and others to make the knowledge of geographical facts within the direct observation and experience of the pupil the basis of all geographical instruction, and to demand this as a psychological necessity for the right understanding of phenomena more distant. This method of beginning with the geography of the home is now generally universally recognized, although very little practiced.

3. Representation is of the greatest value in teaching geography. Map sketching arose in Greece before text-books were

written. The Greeks gave much attention to perfecting maps. Ptolemy was one of the first to make the map central in geography. Many teachers since have made the map the centre of instruction, and emphasized map drawing. Basedow and Salzman were the first to make large use of pictures and relief maps. We now have the use of many methods of representing relief and our geographical texts are veritable medleys of pictures. The Germans use large wall pictures instead of many pictures in the text-books. Their atlas is also separate from the text. Many American schools are now being equipped with lanterns and series of slides illustrating the various topics and countries considered in the study of geography.

4. In the adaptation of the teaching of geography to the child some progress has been made. It has followed the general lines laid down by Comenius, while modern scientific development has added another. These lines are I. Observation and orientation in the home surroundings; II. Expansion of this experience to include the whole earth, using the constructive imagination, aided by pictures, maps, models and products, and memorizing the more important facts; III. The collecting of these facts learned in isolated groups into larger groups, connected and correlated by causal connections.

Locke's observation regarding the teaching of mathematical geography is important. The relations of the equator and other circles to the poles, latitude, longitude, distance according to scale are still among the first facts of geographical study, regardless of the fact that children at this early age have no correct conception of the geometrical relation of these things. We often insist that the child shall draw to scale, understand scale, before he thoroughly understands the use of fractions. Salzman's comment, quoted above, is appropriate here. Locke, after the first observational work, had the pupil study arithmetic and geometry before taking up facts of mathematical geography. It is a rather sad comment on our pedagogical advance that we are still struggling with such obvious inconsistencies.

5. Geography, perhaps better than any other subject, illustrates the long continued conflict between the logical and the genetic method. It has only gradually come to be seen that the child and not the method is first in importance and that a method fitted to one stage of his development may be unfit for another. The general opinion of teachers and text-book writers of geography in the past has been apparently that for the child it is necessary only to present a smaller number of facts at a time and more condensed, and that but little change of method is necessary. There has yet been no adequate study which correlates the methods and materials of geographical instruc-

tion with what is known of the development of the mind, the instincts, and the interests of the child. This review also shows that the main improvements in method of teaching geography, excepting the scientific method, perhaps, have come from educators rather than geographers. The subject now most needs unification of method and materials according to the various grades of instruction. The subject greatly needs among its writers and teachers men who have had a wide experience and thorough special training in both geography and education.

6. During the past century the main emphasis of effort to improve the teaching of geography has been in the development of the topical method, the method by types, and the application of the scientific method. These methods have worked to secure greater unity of fact. These methods give a better training of judgment and reason, and make it possible to apply comparative and correlating methods to facts otherwise widely separated. The scientific method in the more advanced stages brings the facts into series of causally related phenomena. The advance in scientific geography during the past half century has been great, and has done much to improve elementary methods, but we have erred in trying to force children to use the scientific method. The reaction has already begun, and must ultimately end in adapting both methods and materials to the developing abilities of the child.

III. Present Status of Geography in Europe.

England, in spite of the fact that she is so largely a commercial and colonizing nation, in her institutions of education has neglected the study of geography. During the past fifty years, improvement in the instruction in this subject has been mainly due to the efforts of the Royal Geographical Society (71). It was only after a number of vigorous appeals, and the final offer to pay the salary of the teacher, that a readership in geography was established in Oxford in 1887.

Geography is now compulsory in the primary schools, and in many places is being taught well, and home geography is being emphasized; large scale maps, geographical pictures and models are being more generally used.

In the great public secondary schools geography is but little taught, for the aim of these schools is in the main to fit for the university examinations, which emphasize classics, history and mathematics. (61-14.) Up to a few years ago these schools were without apparatus, adequate maps, or method. During the past decade, however, there has been some improvement in these respects.

Geography has been stimulated in the universities by the ex-

ample of Germany and of Harvard. Oxford in 1902 gave a number of courses in geography. Geography was also taught in thirteen other colleges and universities. In the Royal Naval College and the Royal Military Academy but little attention is given to geography, its importance not being recognized as in France and Germany.

In *Russia* considerable attention is given to geography both in the elementary and the higher schools. The order of treating the various countries differs from that usually followed. After studying the home surroundings or the earth as a whole and learning to read maps, most time is given to studying Russia, and then Siberia. Of other countries, most emphasis is given to China, Thibet, Persia, and Arabia, while the study of Europe begins with Greece and ends with Great Britain. The other countries receive but little attention. The habit of studying Asia in detail before Europe gives a general idea of the remoteness of European countries, and turns the face of Russia towards Asia.

In the Russian colleges and universities, geography is considered an eminently serviceable branch of higher education. St. Petersburg has two professors of geography and there are professors of geography at Moscow, Karkhoff, Kazan, Dorpat, Warsaw, and Helsingfors.

In *France* geography has suffered from being too closely combined with history. It is still taught in many of the higher schools by professors of history. Interest in the subject, however, has been rapidly growing, and geography is now looked upon as a serious study. In the University of Paris there are four chairs in geography, all of university rank, and seven or eight of lesser rank. It is also taught as a subject of first rank in twelve other universities. Considerable attention is given to colonial, commercial, and economic bearings of the subject.

In the military schools, geography is given very high rank. Besides a thorough course in general geography, the student must know the physical geography, orography, hydrography, the boundaries, the strategic positions and characters of the countries, in great detail, especially those of central Europe, and be able to sketch in detail, from memory, portions of France and adjoining countries. Since, as was well illustrated in the Russian-Japanese war, knowledge in detail of the geography of a country is of first importance for the successful conducting of a campaign, this training of the French soldier and officer to know minutely the geography of his country and surroundings would in war be almost as valuable as the ability to command and direct.

In the lyceés geography is studied one and one-half hours a week in the first two classes and one hour in the remaining five

classes. In the first year or eighth class the pupil becomes accustomed to maps, apparatus, and geographical terms, and studies the world as a whole. The geography of France is studied with increasingly greater thoroughness in the seventh, fourth, and first classes. An interesting feature of the course is that voyages of discovery and history of geographical discoveries form a part of the material of instruction. These topics offer a rich treasure of highly interesting cultural material.

In the primary grades most attention is given to the geography of France and its colonies. Knowledge of the home country is demanded even if the pupils remain generally ignorant of other countries. This is in strong contrast with our general practice, which gives the pupils general world views before the study of the home country in detail.

Germany, as already pointed out, for more than a century has led the other countries of the world in geographical instruction. Since the time of Pestalozzi and Basedow primary instruction in geography has centered about *Heimatskunde* or home geography. Pupils are first taught the points of the compass and then to observe their surroundings. They study the different land and water types, the fields, forests, cultivated plants, the animals, and the means of communication. A large map of the region forms the basis of the map work. The region is also modeled in sand and shown on relief maps. Reference is made to historical places and industries and occupations are observed. The text-books are mainly for the aid of the teacher. In some of the cantons of Switzerland these books are veritable mines of facts treating of the geology, geography, botany, zoölogy, and history of the canton. In Germany nearly all important cities are provided with special texts and maps, for teaching the home geography of the city and district.

After the home circle, some teachers proceed by widening circles to include Germany, Europe and the world, while others take a general view of the whole world before specially studying the fatherland. In either case, much the greater part of the time is given to the study of Germany and its colonies.

In the German higher schools the work in geography is still handicapped by the prejudices of the teachers of literature and history. Professor Wagner thinks but little progress has been made in the training of teachers for geography. Of the 2,827 teachers instructing in geography, in the 523 higher schools, only 33% had been trained in geography. (89-8.) In some places the various classes are taught by nearly an equal number of teachers, as for instance the 38 classes in geography in the gymnasium and realschule in Kassel are taught by twenty-seven different teachers. The programmes are also very irregular.

In general the work in these schools includes two hours a

week through eight or nine classes and covers mathematical, astronomical, physical, political, and economic geography. Much is made of map reading and map drawing. The schools are well equipped with apparatus and maps. (61-44.)

Geography is required as one of the subjects for the leaving certificate in all German schools, and on the examination of candidates for teaching it ranks with religion.

Immanuel Kant was probably the first to lecture on geography in a German university. Ritter, at Berlin, was the first professor of geography. At the present time Germany is much in advance of other countries as regards the place given to geographical instruction in the university. All of the universities now give courses in geography. Of the 28 universities in 1902, 7 taught the history of geography, 19 gave courses only in general and physical geography, 27 gave special courses in geography, as anthro-geography, bio-geography, oceanography, meteorology, or the geography of different countries, 3 gave instruction in the methods of teaching geography, while practically all gave courses in cartography. These courses were given by more than 50 professors and private docents, besides numerous special lecturers. For the degree of Doctor of Philosophy, geography has the same value as languages, history, mathematics, or the other natural sciences. (61-58; 71.)

Of the 12 technical schools, 4 do not teach geography. The others have professors of geography. In the polytechnic at Zurich there are 4 professors of geography, giving courses in the history of geography, physical geography, oceanography, anthropo-geography, and special geography of Africa. Commercial geography, following physical and political geography, is taught in some of the technical schools and in the commercial schools. As in France, in the military schools the geography of Germany and neighboring countries is studied in detail.

Austria follows closely the methods of Germany. In the lower schools the work is more closely connected with history.

The University of Vienna has two professors of geography.

In *Italy* geography is necessary in degree examinations. It is taught in most of the universities. The Italians still excel as map-makers. Much improvement has recently been made in the methods of teaching in primary schools. Geography is taught in the technical, naval, military, and commercial schools.

In *Spain* geography is an important subject of study. Recently primary methods in this subject have been remodeled after those of Germany. Much is being made of the geographical excursion.

In *Holland*, *Belgium* and *Sweden* the work generally begins with the study of the village or the town, the district and the country, which is then followed by a study of the globe.

Everywhere in Europe the subject is growing in importance. During the last two decades it has become a university subject of recognized worth, with separate chairs and professors; while in Germany, Spain, Italy, and Switzerland, it has become necessary for examinations for degrees. The rapid growth of the subject in universities is giving rise to a large number of specially trained young men who, as teachers, army officers, merchants, consular officials, etc., are rapidly extending the work in its scientific, economic, and pedagogical aspects. Many geographical societies have been established which are doing much to improve the methods of teaching their subject.

Summary. In summarizing the present practice throughout Europe the following points are made evident:

1. The study of the home surroundings of the child, thereby fixing in his mind by direct observation and experience the basal ideas of geography, has been adopted in practically all the countries as the first and essential stage of geographical instruction. This recognizes the principles that all knowledge is based upon sense perception and that the imagination can construct ideas of the unseen only by reference to the ideas of things seen. It is also well adapted to the stage of mental growth of the child at this period. The use of excursions and the study of the home surroundings do not cease with this first stage, but are continued even to the university.

2. In the secondary schools the course also usually begins with the home district and the home country. The latter is returned to once or twice for more mature treatment. Some consideration is given to the history of geography, including geographical discoveries and explorations. Commercial and economic geography illustrating the commercial values and relations of the various countries and of the home country and its colonies, receive considerable attention. In the most important countries except England, a thorough course in geography is necessary for those entering the consular service.

3. In the military schools in these countries geography is one of the studies of first importance. In England, however, it has only a very subordinate position.

4. In the universities the rapid rise of geography in recent years is largely due to its being treated not as a cosmography or of value only because it aids history, but because it is a science which uses descriptive facts as data for the investigation of the morphology of surface forms, their distribution, causes and effects upon climate, plant and animal life, including man, as its fundamental problems, capable of scientific solution and of the greatest importance and value for man and his activities. For the treatment of these problems in their scientific relations a breadth of knowledge and a general training of mind are de-

manded equal to that required in other university subjects. These facts are being widely recognized and account for the rapid growth of geography in the universities of Europe.

IV. Geography in High Schools in the United States.

According to the Report of the Commissioner of Education, in 1901 23% of all the pupils in high schools in the United States, public and private, were studying physical geography. In the business courses in high schools 57% of the pupils were studying geography.

Among the studies in high schools, geography stands eighth and has maintained this rank since 1895. Geography now stands as the first of the natural sciences in high schools in number of pupils studying it. The important place given to this subject requires that it be taught by inductive and laboratory methods. At the present time, however, in most high schools, the text-book is the main object of study. There is an inadequate equipment of maps and other materials, and no out-of-door work. Present school programmes are too inflexible to allow double periods or half-day excursions. Most of the teachers know the subject only from the text-book. To make the subject worthy of the place it now holds, the teachers must have more special training in this subject, conduct their classes oftener in the field, and make a larger use of maps and models, and of scientific and laboratory methods.

Commercial geography has also come to be an important subject in high schools, especially with the growth of business courses. It has, however, been mainly a dry summary of products, commercial routes, and economic conditions, with little or no reference to the causal or historical connection of the various topics. The subject was introduced without regard to the lack of knowledge or training of the teachers, and until recently there have have been no good text-books on the subject for use in high schools.

This study should follow a course in physical geography, and should consider the commercial and economic conditions of the various countries, giving in outline the commercial and economic history of each, the geography of the most important products, and the geographic and other important factors which influence these. It should aim to give the pupil a wide, intelligent outlook over the commercial conditions and relations of the various countries, and should be of considerable value as a culture subject.

V. Geography in Our Normal Schools.

The number of subjects taught under the head of geography in the various normal schools in the United States, varies

greatly with the purposes, organization, and equipment of the schools. In general, physical geography is taught in about 80% of the normal schools, while a smaller percentage give a course in general geography. About three-fourths of these schools give courses in methods of teaching geography. A few give courses in the physical geography of United States and of Europe, Commercial Geography, and Meteorology.

The following summary of thirty-eight replies to questionnaires sent to normal schools shows the characteristic conditions:

General Geography: In 33 general geography is taught. In 6 it is taught with methods. In 5 it is not taught. The length of the course varies from one year to fifteen weeks, with an average of about twenty weeks.

Physical Geography: 30 teach physical geography. In 5 it is taught with general geography. The average length of the course is 12 weeks.

Methods of Teaching Geography: In 35 out of the 38 methods are taught for a period varying from 4 to 12 weeks. In 6 methods were taught with general and physical geography, while in 3 both general and physical geography are taught mainly with reference to the methods of teaching.

Special Teacher: There is a special teacher of geography in 28 of these normal schools, but in only 19 of these 28 schools the methods of teaching geography are taught by the teacher of geography. The methods are usually taught by the teacher of methods. Frequently, general geography, physical geography and methods in geography are taught each by a separate teacher.

Training: In reply to a question regarding the training of the teacher in geography and in pedagogy, 32 replied affirmatively, and 5 negatively in geography, and 26 affirmatively and 4 negatively in pedagogy. A few of the affirmative answers, however, were qualified as "some," "a summer course." Again it is probable that a large number of those who reported having had special training, had received such training in normal schools having courses similar to their own. A good number of these teachers, however, have had university training in geography, and it is generally in these schools that the work is not only more thorough, but better organized.

Out-of-Door Classes: Another point of inquiry referred to the training of pupil teachers to conduct out-of-door classes for observation in home geography. In only about two-thirds of the normal schools the pupils have some opportunity to observe and practice with classes out of doors. A much smaller portion mention this work in their printed courses. Of the definite replies received on this subject, 23 were affirmative to 13 negative, while a few of the affirmative replies were modified by the term "occasionally," and some of the negative by "recommended only."

As we have seen in the history of methods of teaching geography one of the most important reforms was instituted when the direct observation and experience of the child in the little world within his horizon was made the basis of his future geographical instruction. It has taken more than a hundred years for this simple truth to find general application. This progress should be led by the normal schools. The universities have emphasized the scientific treatment of geography. Teachers

in general have adopted this scientific attitude but without its spirit. The facts are no doubt better taught but they are taught mainly from books and without actual observation. Further, the work in the normal schools is not keeping pace with the demands made by many city school systems. The majority of the city systems demand the study of home geography by excursions, yet less than fifty per cent. of the normal schools offer any training to meet these demands.

The present organization of most normal schools does much to foster this weakness. General geography, physical geography, methods of teaching geography, and observational and practice work are generally taught by two or more teachers, each working independently. The special teacher of geography is often too scientific, too advanced, too far from the schoolroom, and the teacher of methods knows little of modern geography and is conventional in ideals and plans. The special teacher of geography should have had extensive training in both geography and pedagogy and sufficient experience in teaching in the grades to adapt his instruction so as to be most useful to the pupil teacher in her work in the schoolroom later. The cultural knowledge of the subject should be mainly acquired before the pupil enters upon the two year normal course. This knowledge should be reviewed, broadened, deepened, but only in connection with methods and the subjects or topics in which the pupil teacher is later to use them in her teaching.

In geography, instead of having three courses, general and physical geography and methods in geography, these should all be combined into one course, for those who are to become teachers in the elementary schools. In this course, the normal pupil should study the main topics through the grades, following some excellent course of study as an outline, learning the methods of teaching these topics, teaching them, seeing them taught, and gathering materials, making apparatus, and reading widely on each so as later in her own schoolroom to have a fund of material for illustration. Further, the normal pupil should be taught by the special teacher, when possible, with the same general method and materials that the pupil teacher should use later.

By following this general plan in normal schools, much time and energy will be saved, the pupils will get considerable actual training in methods, teaching, and observation, and they will gather new facts and materials in the connections in which they will be used later in teaching. This plan also takes full account of the power of imitation in the training of a teacher. It also gives added interest to the work of the pupil, for each step has its practical bearing, its spontaneous interests of observation, preparation, reading, etc. Above all, the pupils

when they leave the normal school will have wasted no time in acquiring knowledge which they have neither the power nor the genius to adapt to the particular class before them. Present training fails just where it should help most.

In connection with the geographical department of the normal school, there should be a geographical museum containing products, pictures, maps, globes, models and collections representing the home district. The pupil should become accustomed to using these for illustration, and should have some training in blackboard drawing, map drawing, and the making of models.

VI. Geography in Our Technical Schools.

Of sixteen of the most important technical schools in the United States, geography is taught in only five in connection with technical studies, as civil engineering, forestry, landscape architecture, geology and mining engineering. Several of these schools, however, which have no courses in geography, have courses in elementary geology, and a number require physical geography on the entrance examinations.

In the Sheffield Scientific School at Yale, geography is taught with forestry, botany, and zoölogy. In the Scientific School at Harvard, it is taught in the course of landscape architecture, with elementary geology.

In both Yale and Harvard, and in practically all of these schools, elementary geology is a required study in civil engineering and surveying courses. In railroad, geodetic, and general surveying, the civil engineer has to do more with the features of relief than with their history. Knowledge of the morphology of surface forms, with which he is mainly concerned, of the action of streams, the interpretation of their courses, the natural history of land forms, etc., would be of greater practical value than a knowledge of the geological history of the country being measured. The course in geology should be followed by a course in physiography, which should give considerable practice in map reading and in geographical field work. The scant attention given to geography in the technical schools of America is in striking contrast with the important place given to it in similar schools in Europe.

VII. Geography in American Colleges and Universities.

Of 88 colleges and universities in the United States, whose catalogues were examined, 45 offer one or more courses in geography, mainly in physical geography, while 43 do not mention the subject. Of the 45 giving courses about one-half

give more than one course, while at ten of the larger universities, several courses are given. Seventeen courses are given at the University of Chicago, which include several in economic geography and a course in botany, in zoölogy, and in meteorology. Six courses are given at Columbia, including several courses in methods, six courses at the University of California, including several courses in commercial geography, and five courses, mainly in physiography in Cornell, University of Nebraska, and Harvard University. There are no courses in the history of geography, which is so generally given in European Universities. The main emphasis is upon physical geography. The relation of geography to life, especially that of man, and to history is not so much emphasized as it should be. Cartography has little or no place. Commercial geography is taught in the Universities of Pennsylvania, Nebraska, Chicago and California, and Louisiana State University. Courses in the theory and practice of teaching geography in elementary and high schools are given in the Teacher's College in Columbia University, and courses in teaching physical geography are given in the Universities of Michigan, Nebraska, Chicago, and Harvard. Only the University of Chicago has a separate department in geography.

In all these universities and in many colleges geography is taught by a professor, but in most cases the professor does not give his whole time to the subject.

Geography as a physical science closely related to life should have a more prominent place in our colleges and universities. In most discussions of the general progress of life, whether of plant or animal, in whatever stage of development, the influence of the geographical environment is more and more recognized as a determining factor. The geography of any particular age or species is, therefore, the basis of explanation of that age or species. If, then, biology, history, and anthropology with its economic and social sciences which deal with life in a geographical environment, are rightly everywhere recognized as proper and worthy subjects of study for the college or university student or the specialist, it is only a matter of a short time when geography, which forms the background of these sciences, will stand on equal footing with them in our higher institutions of learning. The progress during the last fifty years confirms this view. While chemistry, physics, botany, zoölogy, and the human sciences have been making only conservative progress, geography has been progressing rapidly. In 1871 the first chair in geography in Germany was established in the University of Berlin, while now there is a chair of geography in nearly all the German universities on equal standing with other subjects. The progress has also been

comparatively rapid in this country. In Harvard, University of Chicago, and possibly other schools, the doctor's degree may be given in geography. In the high schools, as we have seen, the number of pupils studying physical geography is far larger than that of any other natural science. When the nature of geography as a science is more fully understood, the same general tendency may be found in the colleges and universities.

For improvement of the work in geography in the colleges, special professors should be secured and allowed to give their whole time to the subject, and proper laboratory and library facilities should be provided. The courses given should include (1) General physical geography, (2) Economic geography, (3) Geography of Europe and the other continents, and (4) History of geography, geographical discovery, and the influence of geography on history. More attention should also be given to geographical factors in the study of botany, zoölogy, history, anthropology, and economics. In engineering courses, elementary geology, usually a required subject, should be supplemented by a study of the physical geography of land forms, and of maps and cartography.

The universities should have ample facilities for study and research, leading to the degree of doctor of philosophy or doctor of science, after three years of graduate work, with the following special topics required: (1) Geology with field work; (2) History,—general history, economic history, and the history of geography; (3) Meteorology and Climatology; (4) Oceanography; (5) Anthropology; (6) Cartography; (7) Commercial and economic geography; (9) Zoölogy and Zoögeography; (8) Botany and botanical geography; (10) General Physical Geography; (11) Physiography of the United States, and of the continents; (12) Research, with extended laboratory and field work, with theses, and (13) Methods of teaching geography and of geographical illustration.

VIII. Geography in the Elementary Schools.

The present condition of the teaching of geography in the United States in the elementary schools was studied in three ways: 1. The courses of study of cities and states; 2. A special questionnaire directed to superintendents of city schools and teachers of geography in normal schools; and 3. A general questionnaire on conditions and improvements.

1. Courses of Study. The courses of study in geography of our cities and states show first of all and most strongly the dependence upon the text-books. Most courses follow the adopted text-books not only in general plan, but page for page, term by term, year after year. Most text-books, after an outline of North America, take the United States in detail, and

the various continents in order, ending with a consideration of Australia and the Pacific Islands. Following the same order, most courses give the greater part of the last and maturer year to the study of Africa, Asia and Australia. Nothing shows better than these courses of study the power of text-books, in the present state of administration of public schools, in shaping both method and content of the courses of study.

The number of courses of study showing some degree of independence of idea is comparatively small. Of these twenty-one were studied in detail. They are by no means the only cities doing conventionally good work in geography, for in many places the courses of study were either out of print or being revised. They are, however, fairly representative.

The twenty-one cities and states mentioned above are:

Rochester, New York,
Syracuse, New York,
Allegheny, Penna.,
Johnstown, Penna.,
Williamsport, Penna.,
York, Penna.,
New York City,
Springfield, Mass.,
Albany, New York,
Pittsburg, Penna.,
La Crosse, Wisconsin,
Racine, Wisconsin,
Cincinnati, Ohio,
Boston, Mass.,
New Orleans, Miss.,
Chicago, Ills.,
New Britain, Conn.,
Providence, R. I.,
Fort Wayne, Ind.,
Arizona State Course,
North Dakota State Course.

While seven of the cities mention geography in the first grade, it is mainly a study of plants and animals, with some observation of the clouds, sun, etc., and of distance and direction. Four include the study of the home; two, occupations; three, the compass; and one drawing to scale.

Three-fourths of the cities begin geographical studies in the second year. The main emphasis is upon the study of land and water forms, the weather, distance, direction and location. About one-half speak of excursions, while a slightly larger number emphasize home geography. One teaches the globe, another "drawing to scale with accurate measurement of lines." A number of the courses emphasize the reading and telling of stories of life in other countries, especially child life, contrasting the foreign with the local conditions of life.

The distinctly geographical work in most cities is begun with the Third Grade. Here the emphasis is very decidedly upon the study of the home surroundings and direct observation by the pupils. About sixty per cent. of the cities require the study of the geographical factors in the home city, and about twenty-five per cent. of these provide for excursions, and devote the entire year to the local geography in this way. A few expand the home geography to the home state. The study of the forms of land and water, and learning to read and make

maps are important requirements in nearly all courses. A few courses include the globe, the continents, the home state, or the United States in this year's work.

In about half the courses the compass, and in one course the barometer are mentioned as objects of study. One course confines the teaching wholly to the use of books and maps. A good number of the courses provide supplementary readers.

In Grade IV there is general agreement upon a study of the earth as a whole; North America, and United States are the most important topics. In about one-fourth of the cities the study of home geography is continued. The pupils begin the use of a text-book. A few mention a general study of the continents before taking North America or the United States in detail. Several connect closely the work in nature study with that in geography, or combine geography and history, arranging the work in parallel courses.

The work in Grade V emphasizes a study of North America, United States, and Europe with a more general study of the other continents. In this grade the United States is usually taken in detail. A few courses defer the work usually done in the fourth grade to this grade. The home state is strongly emphasized in some courses. In one city geography is combined with the study of current events. One city requires the pupils to learn areas and populations.

In Grades VI, VII, and VIII, there is much less agreement as to the main topics to be emphasized. In the sixth grade the majority take South America, Europe and the other continents with a review of North America. In the seventh grade Europe, Asia, Africa and Australia are usually studied in detail and North America and the United States are reviewed. In most cities the general course in geography ends with the seventh grade. In the eighth grade North America and Europe receive most attention, while commercial, mathematical and physical geography receive some study. The study of general geography ends with this grade. In the ninth grade physical and commercial geography, are in a small number of cities important subjects of study. Most courses end with the eighth grade, so that these subjects may more properly be considered as parts of the high school curriculum.

The study of home geography, with excursions, is most emphasized in the second and third years and ceases with the fifth year. While home geography and out-of-door observation are placed in most courses as the basis of geographical instruction, yet in actual teaching, home geography more often means the study of pictures, local maps and natural objects brought into the schoolroom rather than observation out-of-doors under the guidance of the teacher. About sixty per cent. of those pre-

scribing home geography also require excursions either regularly or occasionally. Small as this number must be of the whole, yet it is encouraging for it represents recent progress in an untried field of work for American teachers, for which they have had no training and practically no experience.

The study of the home state varies greatly. In a few courses it follows immediately upon the home district, but the majority favor its study in the fifth grade following a general survey of the continents, or a thorough study in review in the seventh grade.

Maps and map making appear most often as objects of special study in the courses for the third grade, because it is at this period that map studies begin. Thereafter it is an important part of the regular study. A few places, however, give map study a very prominent place throughout the study of geography.

The recognition and definition of land and water forms are learned mainly before the pupil begins the regular study of a text-book. This represents a distinct advance over former methods. The study of the text-book is begun with few exceptions, only with the fourth year.

The globe, or "the earth as a whole," is studied mainly in the fourth year, while there is a tendency to defer this work to the fifth year. In the study of the continents, North America stands first, Europe second, and South America third. In several cities commercial, mathematical, and physical geography are studied in the higher grammar grades.

As to method, a good number of the courses emphasize the study of types, and a few are thoroughly consistent throughout, giving an excellent outline. Observation is claimed by practically all as the basis of instruction, but is not really so in practice. Geography and nature study are commonly taken together in the first grades, while in a few cases geography and history are made complimentary in the upper grades. Many if not the majority of cities use easy supplementary geographical readers in the lower grades and more comprehensive readers in the upper grades. These give life to the dry statements in the text-books and create a real interest in the conditions of other peoples and lands. The use of these readers as they are improved both as to contents and adaptability is rapidly becoming a very important factor in instruction in this subject.

Summary of Courses. Taking a general average of the courses of study including several not considered in the above detailed analysis, arranged as to their more important topics, they run about as follows:

Grade II. The simplest elements of home geography, with

observation of land and water forms, plants and animals, and the life of the people.

Grade III. Home geography more in detail, including a more careful study of land and water forms and their representation on maps; stories and reading of animals and people in distant lands.

Grade IV. Idea of the earth as a whole and its representation by globes and on maps, reading of maps, map drawing and modelling, continuation of home geography with a brief study of the home state, a general idea of the continents, and the use of a text-book and supplementary readers.

Grade V. A study of the continents with special emphasis upon North America and the United States.

Grade VI. A special study of Europe, South America and the remaining continents.

Grade VII. A general review, with a special review of North America and United States.

Grade VIII. North America and Europe reviewed in detail and the elements of commercial and physical geography.

To determine the amount of time given to the study of geography in the various grades a special questionnaire was sent to city superintendents throughout the United States. The replies indicate that the average time for daily recitation varies throughout from 15 minutes to 60 minutes. The disagreement on the length of daily recitation is well illustrated by the following summary for grades V and VI.

	Number of courses.	Time in minutes.		Number of courses.	Time in minutes.
	1	15		1	15
	1	18		1	18
	2	20		2	20
	7	25		8	25
	6	30		4	30
Grade	2	35	Grade	4	40
V.	2	40	VI.	2	45
	4	45		5	50
	4	50		3	60
	3	60			

This great variability for five recitations a week illustrates an important pedagogical defect regarding the instruction in this subject, that is, a lack of general agreement as to its estimated relative value. There can be no doubt of the practical and cultural value of geography when well taught, but one may very properly question whether the pupil in the most important years of his school life should give one-fifth of his school time to this study.

2. IMPROVEMENTS. The replies to a general questionnaire on conditions and improvements indicate a general desire for improvement, and there can be no doubt that the teaching of

geography in the elementary schools has improved much during the past two decades. The nature and interest of the child have been taken more into account; home geography and direct observation have become recognized as the necessary foundation and generally demanded; there is less memorizing of unimportant and unrelated facts; the instruction turns more toward life relations, toward dominant and practical interests; the pupils read more; more use is being made of map study, of pictures, models, and other illustrative material; greater unity and more freedom from the text-book has been secured by the use of the topical method and type studies; the causal connection of facts is being more emphasized to secure a logical unity of fact and for scientific training; nature study and geography are often taught together in the lower grades and geography and history in the upper grades; and some excellent supplementary reading has been published.

3. DEFECTS. Some of the main defects in the present teaching of geography are outlined in the following extracts from letters of special teachers of geography, principals of normal schools, and superintendents.

"Lack of properly trained teachers; proper equipment for home and industrial geography; the need of better text-books. Most text-books are too cumbersome in style for the average child."

"Not enough home geography. Not enough expedition work. Too many disconnected facts which burden instead of enrich the child's mind. Not enough use of types, enlarged and enriched by many concrete facts. In the grammar grades not enough topical and comparative study. The underlying defects through the courses is a lack of connection between the subject taught and the life of the child, both as to his physical and social environment."

"Illogical and unscientific books. The teaching of words and locations rather than things and relations. The failure to have the pupils in the more advanced grades do some library work in geography, that they may learn geography is not a book but a science. The failure to make the subject alive and a part of the life of the pupil."

"Lack of systematic study of the sense phrase of geography; the child recites words, words, words. Another defect is the hop, skip and jump manner in which we study countries."

"Teachers do not know how to organize and arrange subject matter, nor how to teach it logically. The subject must be reduced to its simplest terms and its teaching illustrated."

One of the most important defects mentioned by nearly all writers on the teaching of this subject, is the lack of properly trained teachers. In many respects, this is a very convenient way of disposing of the whole matter. In most places, the overcrowding of schoolrooms and overworking of the teachers make out-of-door observations in classes impracticable. Improvement in school organization and management, and simplification of courses of study and text-books will do much to improve the situation for the teacher.

On the other hand, as we have seen, the normal schools and universities, which train teachers, have not properly provided for instruction in this subject. In fact, the demands in the schoolroom are in advance of the training given in most of these institutions. Besides, the modern view of geography is so recent that many of our present teachers and a much smaller number of supervisors have little or no idea of how to organize and teach it. Taking these facts into consideration this defect is a most important one. Special training in this subject is required more, perhaps, than in most of the common school branches, for each teacher must organize the first work in the subject according to the district in which she teaches. She must possess and know how to use a rich fund of material.

Other defects in teaching geography, such as lack of training in direct observation, too little attention or too much attention to causal connections, unadaptation of methods and materials to the development of the child, and dry, cumbersome text-books, will be considered in the following discussions.

4. Home Geography. In all the important countries of Europe and in the majority of cities in this country, the subject of home geography receives much attention. The learning of geography has especially to do with things and definite images of things. Personal experience is the final basis of geography. Learning the more important geographical factors is one of the main purposes of teaching home geography. It gives a mass of apperceiving concepts necessary for future study.

A great mistake, however, is made in sacrificing the interests of the child. Children in the first grades are most interested in life and its doings, and not in physical features of the earth and the processes of their development. The physical factors of relief, the morphology of form, the making of plains, the processes of mountain building, etc., because they are the fundamental ideas of physical geography and admit of observation and illustration, have been pushed down from the university into this earliest stage of geographical study. It is the business of the upper grades, when the pupil has mental grasp, some power of reasoning, and a mass of descriptive facts, to consider geographical facts in their logical relations, and the physical factors which form their background. I can see no sufficient reason why physical and commercial geography should be crowded into these first grades under the title of "home geography," if these subjects are to be main objects of study in the upper grades. The so-called "home geography" as outlined in some text-books does not deserve the name. The topics to be considered vary with the localities, and can be treated only in special texts on the home geography of these

districts. Such books are common in Germany, but have not yet come into use here.

Another important defect in practice everywhere is that the study of home geography practically ceases after the pupils begin the study of the text-book. This may account in part for the early emphasis on physical geography, but it disregards the natural interests of the child, and his mental development. If geography is a science at all, the first general observations must admit of and require more detailed observation, the searching out of more definite facts, and the working over of old materials by more comprehensive methods to arrive at wider conceptions, applications, and connections. The study of geography by observation must be continued throughout. Observational work must be graded and adapted to the capacities of the child. All geography is an extended home geography.

For the study of home geography, out-of-door study is necessary, yet most of our city courses prescribing home geography make no provision for out-of-door study. This is also true of the work done in the normal schools. Such a procedure certainly approaches a contradiction. It is objected that excursions take much time from other studies; classes are too large and discipline too difficult out-of-doors; excursions are unconventional; time is not provided for this work in school programmes; children are often too poorly clothed for country walks; excursions generally cost money; and teachers have had no experience in teaching out-of-doors. These are all more or less serious objections, yet they are mainly of organization and preparation, and of a secondary nature. The value of studying things at first hand is sure to be more and more recognized. The teacher must learn to do this work, and institutions which train teachers must see that she knows both the facts and the methods necessary.

5. METHODS OF INSTRUCTION. As regards both the methods of instruction and the choice of materials there is the greatest diversity of opinion. Many a superintendent and teacher who has undertaken to improve conditions can fully understand a superintendent's state of mind who writes, "The more I think I am improving the course, the more at sea I find myself." This general condition indicates a lack of a body of generally accepted principles according to which the methods may be formulated and the materials chosen. I have attempted below to arrive at some such principles through A. Study of replies received from a questionnaire: B. Studies of the mental development and interests of children; and C. A special study of children's geographic interests.

A. *Questionnaire replies.* In reply to the question, "How

do you adapt the content and the method of geography to the various stages of mental growth represented in the public schools?" numerous replies were received from all parts of the country. The following selections represent the more important ideas expressed.

"The first lessons are object lessons. As the work progresses more stress is laid upon the relation of cause and effect. Throughout the course the eye and hand are trained in observing, sketching and moulding."

"Magnify the industrial point of view in the lower grades, minimize the physical; in the upper grades, keep the two on a par."

"The fundamental facts are first taught from object study directly. This is next supplemented by pictures and stories which proceed from the child's immediate interest to the development of his broader interest in humanity. This interest in humanity is made the centre of interest until the ninth grade."

"In the first stage, the content should be of easily observed facts, and the method that of observation and inference. This with some stories of travel, etc., will be sufficient for the first three years. In the next stage, things observed and experienced should be made the basis for mental images of things beyond vision, the latter to include the shape and size of the earth, land and water forms, climate, vegetation, etc. Relations of causes and effects should be kept prominently in view in the second and third stages, including lastly the effects produced upon the world by man as well as the effects of the environment upon man. Scientific study should come the last of all."

The replies generally agree that there are three stages in the development of the teaching of geography in the elementary schools, corresponding roughly to the stages of mental growth during this period. Briefly these stages, as indicated by the replies, are as follows:

First: direct observation and personal experience with individual geographical facts, furthered by stories and pictures; corresponding to the third and fourth grades.

Second: through the exercise of the memory and imagination the extension of the personal experience and the acquiring of the main facts of general geography by books, maps, models, and pictures; corresponding to grades five and six.

Third: the unifying and the completing of the facts learned, the review of continents and nations with reference to their political and commercial relations, the use of unifying methods of comparison, study by types, and by causal relations; corresponding to grades seven and eight.

B. *Children's Interests.* In geographical instruction neither the mental development nor the interests of the children have been sufficiently taken into account. In general the stages of mental development are characterized by dominating interests and may be stated in terms of these interests. No important attempts have been made to arrange the subject matter and methods of teaching geography with special regard to these most important pedagogical factors.

The more important studies of children's interests in general have been reviewed. The following is a summary of the main facts which these studies establish or strongly suggest.

There is general agreement that there are four periods of development, which, although shading the one into the other, have certain general characteristics.

In the first period, up to the seventh or eighth year, the main interest is in moving objects, in human and animal life, in observing concrete things, in recognition and naming, and in home life and child life.

In the second period, from the eighth to about the twelfth year, personal experience comes to have a wider and wider application. Adventure, travel, the desire to be brave and free, hero worship, the common trades and general industries, collecting and naming objects, the simple phases of social and industrial life, the lives of animals, and the learning of facts by rote are the general interests of this period. There is little or no political interest, and only a general interest in causal relations. There is a deep interest in descriptions of things appealing to the senses in terms of personal experience.

In the period from the eleventh to about the fourteenth year, hero worship, imaginary journeys, voyages, knowledge of different peoples, grouping of facts by natural relations, large views of wholes, usefulness of things, love of nature and art, general social organization and relation of the individual to society are the strongest interests. Pupils now come to care less for concrete things and more for the relations of things. (90, 91, 92, 93, 94, 95.)

The following period, that of early adolescence, goes beyond the elementary school and will not be considered here, except to say that the intensive study of facts in their logical order appears to be well adapted to it.

C. *Children's Geographical Interests.* The only special study of children's geographical interests, known to me, is that of Sarah Young on "Children's Travel Interests." She tabulated the accounts which 1,280 English children wrote of journeys taken. She found that the personal element gradually decreased about 26% from the eighth to the fourteenth year, that interest in physical aspects, position, and distance increase about 9%, that interest in plants and animals remained about the same throughout, and that very little interest was shown in industries, commerce, and history. She concluded that geography should begin with the home, the town, where foods come from, and other facts directly affecting the pupil personally. Among industries, agriculture and country life stand first, and fishing next. Personal activity, plants and animals are uppermost in the mind of the child while travelling.

In order to get more definite information regarding children's interest in facts commonly classed as geographical, the following questions were submitted to the children in grades IV, V, VI, VII, and VIII in two schools in Worcester, and to the children in these grades in Uxbridge, Mass., and the cities of Ogden, Utah, and Stockton, California:—1. If you could travel all you wished, and go wherever you pleased, where would you go and what would you like to see? 2. About what things in geography do you most like to study? Although at the present time the investigation is far from completeness, nine hundred papers have been read and tabulated, and give a number of valuable and interesting suggestions.

In Grade IV the papers show that children are most interested in people, their manners and customs, their homes, food and dress, in mountains, the ocean and other forms of water, animals, buildings and ships. Many children, especially girls, of this grade desire to travel mainly to visit relatives, and have gained but little interest beyond personal relations with persons and things. Plants are seldom mentioned, but fruits, especially the orange is a favorite. Many children are interested in places because of their historical relations. Genoa is associated with Columbus, Philadelphia with the Liberty Bell, New York with the statue of Liberty, London with the Tower. These historical relations are mentioned much oftener by girls than boys. Most of the associations mentioned are concerned with buildings, statues, etc., not with men. The boys throughout the grades are much less interested in buildings than girls. These facts suggest that the historical associations of places should be more considered, and that associations should be made with the lives of historical heroes as much as with statues, buildings, etc. Japan, China, and Holland are the favorite countries in this grade and the next.

Grade IV. The whole number of papers read, 157. *Girls.* Whole number, 97. Interests. People, 37; Customs, 16; Buildings, 16; Water, 14; Mountains, 14; California, 14; China, 13; Animals, 11; Japan, 11; relations, 9; Holland, 8; Products, 3; Historical, 3; Soil, 1. *Boys:* Whole number 60. Interests. People, 43; Water, 34; Mountains, 23; Customs, 20; Animals, 19; California, 17; China, 14; Japan, 12; Occupations, 11; Ships, 10; Holland, 9; Europe, 8.

Boys are more interested in water and land forms, animals, occupations and ships, while girls are more interested in customs, buildings, relatives, products and historical references. Interest in occupations is mainly confined to those which the pupils may imitate or take part in, as cattle raising, fruit gathering and fishing. The products most mentioned are fruits and cotton. The papers in this grade also show the value of reading stories of children and people of other lands.

The following papers are generally characteristic.

Boy, age 11: "I most like to study about the ocean. The reason I would is because I like to see the large boats come out and in. I like to read about winter. I would like to go bathing in the ocean in the summer. I would like to be in a boat in the middle of ice-burgs and see all the pretty colors the ice-burgs make. I would like to capture a shark."

Girl, age 9: "What I most like to study about in Geography is the different people. They are the black, yellow, brown, white and red people. I like to study about the different races, their homes and customs. I like to read about travels in different parts of the world and how they dress and what is inside their homes and how the little girls play and what they wear."

Boy, age 11: "I would like to go to Italy and see where the post that Columbus used to sit upon and wash the waives as they past by."

In Grade V the whole number of papers read was 334. *Girls.*—Whole number, 158. Interests: People, 62; Water, 41; Animals, 40; Cities, 37; Customs, 35; Buildings, 29; Land forms, 24; Products, 10; California, 15; Fruits, 14; Japan, 10; Maps, Scenery, 4; Occupations, 2; Manufactures, 2; China, 1.

Boys. Whole number, 176. Interests: People, 53; Water, 43; Buildings, 43; Animals, 42; Land forms, 23; Products, 18; California, 16; Customs, 15; Fruits, 11; Scenery, 6; Japan, 6; Occupations, 5; Maps, 4; Manufacturing, 4; Plants, 4; China, 3; Stock-raising, 3.

In Grade V there is a considerable broadening of interests. There is a much greater interest in cities, occupations, products and plants. In this and the following grade many pupils say that they like map study, to find places on maps, and to learn lists of names, capitals of states, etc. One boy says that he knows the capitals of all the states of the United States and of the countries of Europe, and writes them all down with evident pride. This corresponds well with the previous analysis of interests in these grades. This period appears to be the time most suited for the memorizing of facts. Children take pleasure in learning by heart, without much regard for content. It is the time also to teach map reading, and to fix the general outlines of the continents and important features by map sketching. The more important occupations are interesting. The pupils like to learn about what is done, how things are made, how mines are dug, how cotton is raised, how shoes are manufactured, about meat-packing, the life of the sailor, the miner, the wheat farmer, the sugar planter. The products of countries come to be an important interest.

Several pupils in this grade like best to compare cities, countries, sizes of rivers, heights of mountains and peoples. Only a very small number have as a main interest in travelling a wish to see relatives.

The following papers show some of the general interests:

Boy, age 13: "In geography I like to study the country the shape of the World the boundaries. The best thing I like to study is the boundaries of North America I like to study the shape of the world.

I like the study of boundaries because it is more interesting than any other thing."

Boy, age 11: "If I could study anything I wonted, I like to study Geography of how the water washes away the earth and makes deltas and peninsulas. I would wont to study of the ancient citties and the people how they dress and what is there main producates of there country. I also like to study the mountains there size and shape and if earth cracks come there very often. The best thing in Geography is the animals what kind they have and where they live in holes, or in trees, the size of them and if they are wild."

Girl, age 12: "I would like to study about the people of China. I would like to see how they dress and how they build their houses and see how they plant things, and how they fix their hair, and if they have churches and schools like ours, and I would like to know how they sleep and to know if they are buried like we are."

In Grade VI occupations, industries, manufacturing, and products become important centres of interest. There is a marked increase of interest in climate and in the beauty of scenery. There is less interest in the forms of land and water as such, and more in their combination in the landscape. Buildings, the tall buildings of our cities, palaces, castles, towers, the homes of governors, museums and the homes of famous men, are important with both boys and girls. The interests have greatly broadened during the last two grades. They are now less personal. The interest in maps and map-study is still strong. While many pupils say they like to compare countries, peoples, etc., the papers show that this is an important interest. There is a much greater interest in Europe, especially in Italy, Greece, Switzerland and France.

The following shows the general difference between the interests of the girls and boys in this grade:

Grade VI. *Girls.* Whole number, 94. Interests: People, 45; Buildings, 28; Land, 21; Scenery, 18; Occupations, 17; Japan, 14; Water, 14; Animals, 9; Products, 9; California, 7; Manufacturing, 3; Climate, 3.

Boys. Whole number, 101. Interests: People, 31; Occupations, 28; Buildings, 26; Water, 21; Animals, 14; Land, 14; Scenery, 11; Japan, 9; Products, 8; Manufacturing, 5; Climate, 5.

There is greater interest among boys in occupations, water and animals, and among girls in buildings, land forms, and in scenery. Of land forms the girls speak most frequently of snow-topped mountains and the "land of the midnight sun," the scenery along the Rhine, and in Yellowstone Park. Mining is a favorite occupation among the boys.

The following are a few characteristic papers:

Girl, age 11: "What I like to study most in geography is maps."

Girl, age 11: "I like to study about the different people and the different way they dress."

Boy, age 12: "The thing I like most to study is about mining and minerals."

Boy, age 12: "When I travel I would go to China where the great wall is, which is about two thousand miles long and about seventy-

five feet high. I would visit the palace of China, which is marble. I would also like to visit Port Arthur.

"I would go to Mexico, where the people wear big hats with bells on them and where I could see the Mexican bull-fight. I would like to see them dry coffee and to visit the market when open, and see the people work and men smelt silver in the caves. I would enjoy a visit with the common people and laborers in their huts."

In Grade VII, the pupils are interested in a much larger range of subjects. The most interesting facts are often described with considerable detail. The interest in art and historical relations becomes much stronger. The historical interest is stronger with boys and interest in art with girls. Buildings are now interesting more for their architecture, use, or historical connections than for size or height. Paris, Rome, and Venice become the favorite European cities. Many pupils are interested in the change in land forms, in climate, the differences in civilization of the peoples, and the causes of these changes and differences. The papers indicate that this grade is well suited to the study of the elementary principles of physical geography, to widen comparisons of peoples, climates and products, with a general statement of the causes of differences. Cities are very interesting, their streets, buildings, statues, parks and markets being most frequently mentioned. The interest in plants, although not great, is more important than in previous grades.

The order of interests for boys and for girls is as follows:

Grade VII. *Girls.* Whole number, 72. Interests: People, 23; Land, 13; Products, 11; Occupations, 11; Art, 11; Cities, 9; Japan, 9; Animals, 8; Water, 6; Scenery, 6; Historical, 5; California, 5.

Boys. Whole number, 81. Interests: People, 33; Land, 21; Water, 15; Animals, 13; Cities, 13; California, 12; Occupations, 11; Buildings, 9; Japan, 7; Plants, 6; Historical, 5; Art, 4; Out West, 3.

In Grade VIII, the number of papers returned was small, but they indicate an interest in water forms, sea-bathing, ocean voyages, rivers and lakes, the habits of animals of the different countries, hunting, in birds and in cattle raising. Occupations are less interesting, but methods of manufacturing, art and buildings are stronger than in previous grades. Use and causal relations are much more prominent. Topics are treated as wholes and illustrated by particulars.

The following papers will serve to illustrate some of the above points:

Boy, age not given: "I like all geography, but I like best the study of mountain, rock, folds, and the formation of the land. I like to study the water and its courses, and the lakes, also the wind and rainfall of the different places, especially in the trade winds and calms."

Boy, age not given: "I like to study about wild animals of the different countries, and how they are captured, and where they are found, and for what each is used. And how they defend themselves. I like to study about the occupations of the peoples."

Girl, age 13: "I like to study of physical and political geography best, because physical geography treats of the classes of rocks that make up the surface of the land, the leading classes of plants and animals. The part that treats of animals is very interesting because of their peculiarities and different kinds. The plants are interesting because of their different values and uses. The rocks, land surface and water are interesting because of their formation and origin.

"Political geography is still more interesting because it gives an account of the different states and countries in which people live. I like to study about man's habits, customs, his homes everywhere, his rising in civilization, the races and how many thousands of years he was a savage, and how by one step and another he has become what he is to-day, able to do almost anything."

Girl, age 13: "From what I have read, I would like to visit the city of Venice. It is a city of romance, of marble palaces, and guilded halls. It seems to be a fairy city raising up from out the ocean, like the arm, bearing the sword of King Arthur, bedecked with jewels, from out the bosom of the lake. It is a city of art where the breath of God has blown in gentle zephyrs the beauties of all the world to be seen and heard in art and music. I would like to see the beautiful square of St. Mark, with its towers and domes, its business and amusements. I would like to ride some beautiful moon-light night, over the canal streets in a gondola, and to listen to the sweet music from the many pavilions. I would like to visit the fine Art Academy and see the pictures and wonderful collections. And I would like to go to the theatres of Italy."

The order of interests indicated in the papers of this grade are as follows:

Grade VIII. *Girls.* Whole number, 33. Interests: People, 26; Water, 16; Animals, 15; Cities, 9; Land forms, 9; Buildings, 9; Customs, 8; Paris, 6; Historical, 5; Occupations, 5; California, 5.

Boys. A Whole number, 32. Interests: Water, 22; Animals, 17; People, 14; Cities, 14; Land forms, 12; Paris, 10; Buildings, 6; Historical, 5; Occupations, 4; Land changes, 2.

Taking boys and girls together and combining the summaries given in the grades above, the topics which are of most interest in each grade beginning with the most interesting, are as follows:

Grade IV. People, forms of land, forms of water, animals, buildings, China, Japan, Holland, ships, and relatives.

Grade V. People, water, animals, cities, buildings, land, products, Japan, maps, plants, occupations, and manufacturing.

Grade VI. People, buildings, occupations, water, land, scenery, animals, products, manufacturing, climate, maps, and ships.

Grade VII. People, land, cities, occupations, animals, products, water, art, buildings, historical, and plants.

Grade VIII. People, water, animals, cities, land, buildings, plants, occupations, products, manufacturing, and art.

Reviewing the interests as outlined, in the various grades, we find that throughout, the emphasis is decidedly upon people. The first interest in people is very general, but in the

last two or three grades it splits up into interests in customs, occupations, dress, art, and government. Contrasts with our own race and conditions of life are interesting from the first. The child in the lowest grades wants to know how the experiences of the Eskimo child, the Japanese child or the Dutch child differ from his own. In the upper grades countries, races, cities, and climatic regions are equally interesting in contrast with our own and with each other. In the upper grades the pupils are interested to know the causes of these differences, and to learn the outline of man's development from a primitive, savage condition to our civilized state. All this suggests a human centre for all geographical instruction, beginning with simple stories of peoples and ending with a general outline of human and world history and anthropology.

It has been generally supposed that, after peoples, children are most interested in the study of animals, or that they are much more interested in the study of animals than in land and water forms. This does not appear to be generally true so far as this study shows, but the present emphasis of geographical instruction upon land and water forms and but little mention of animals, so that the pupils do not so often think of animals in connection with their likes and dislikes for the study of geography, may have much to do with the placing of animals in the third or fourth place among the interests. Children certainly have a much greater interest in land and water forms than was supposed. This is especially true of water forms. There is a general longing for the ocean, to bathe in it, to go on it in a boat, to fish in it, to cross it, and occupations connected with it. There seems also to be a fascination to follow down rivers. Rivers are attractive features of the countries. Of land forms, there is little or no interest in plains or valleys except the Grand Canyon and the prairies, but mountains are especially attractive. They wish to see mountains, climb mountains, get the view from mountains. Interest in the development of land and water forms is important only after the sixth grade. Pupils early seem to like to compare the heights of mountains, and size of rivers. These facts suggest that instruction in the naming, form, size, and use of land and water forms is suitable for the earlier grades, and instruction in their development and influences is suited to the later grades.

In the fifth and sixth grades, map studying and memorizing are to many children most interesting. This involves learning lists of names, and corresponds well to the conclusions of the studies of general mental development that the period from ten to thirteen years of age is best adapted to learning details and memorizing essentials. During this period the pupil should memorize the geographical facts necessary as a part of a com-

mon school education, and enrich these with a fund of cultural material.

Interest in plants, compared with that in animals, is small. Interest in occupations is greatest in Grades V, VI, and VII, and reaches its climax in the sixth grade. Interest in art and historical connections gradually increases and becomes important in the last grades.

Summary and general statement of method.

If, now, we combine the results of our various studies,—of the history of the methods of teaching geography, the present methods and practice of teaching geography in this country and the more important countries of Europe, and the special studies of the stages of the child's mental development and children's interests, especially travel and geographical interests, we arrive at the following general statements which may be accepted as generally fundamental for instruction in geography in the elementary schools.

1. It seems certain that there are three general stages of development of the mind of the child in the period of years covered by the elementary schools, including the first eight years of school life. The first of these stages includes the life of the child roughly up to about the fourth year in school, to about the eighth year; the second period corresponds in general to the fourth, fifth and sixth years in school, ages eight to twelve; and the third period includes the last two or three grades, from eleven to thirteen or fourteen.

2. It is further generally accepted that instruction, to be in the highest degree effective and economical, must be adapted to the child. This is a fundamental principle. Its application to the instruction in geography is as necessary as to any other subject of study in the elementary schools.

3. The study of geography must have its foundation in the observation of particular things, especially during the first years of school life. The child must get a wide personal knowledge of nature and man in his surroundings. The main emphasis will be upon life, especially of man, his general habits, his food, clothing, homes, and some of the important plants and animals. The pupil first observes and names. He imitates the general simple occupations. He must have much time out of doors with the teacher. By pictures and stories the personal experiences of the child are extended to conditions of other children and people in other conditions of life. The personal element everywhere predominates. Simple obvious causal relations may often be pointed out.

4. In the second stage, covered by the fourth, fifth and sixth grades, the imagination is stronger, and the pupils' per-

sonal experiences must be given a wider and more detailed application to include the whole field of descriptive geography, especially as relating closely to the anthropological side. The out-of-door study with collecting and naming, should be continued. Maps and various ways of representing the localities visited should be presented. The self-activities of the pupils should be emphasized. The various facts of study in nature study, geography and history of the local district, such as the location of the nests of birds, the streams, noted buildings, or the homes of important men, the pupils in these grades should learn to know and to represent on the local map. The study of the home district and state should be continued through these grades, and the facts observed serve to illustrate or explain similar facts in more distant regions.

The pupils should read much about the countries and peoples of the world and learn the main facts of descriptive and cultural geography, to have wider views, broader sympathies, to get some idea of the various states of civilization, and the conditions surrounding them. The facts must be grouped in larger and larger units, and the relations of causes and effects more emphasized. Reviews should be made by topical and type methods and to some extent by causal relations. The human element should still predominate with greater and greater stress on details including art, occupations, manufactures, economical, social and political conditions, with considerable weight upon comparisons. In this period the facts of geography required in common practical life should be thoroughly learned. The pupil must learn the use of maps, and to some extent their reproduction in general outline. Throughout the cultural side should receive most attention. The pupil should read in connection with this work, voyages, travels, and sketches of great discoverers and explorers.

5. In the following period including the seventh and eighth grades, the general facts learned in the previous grades should be reviewed in large wholes connected by causal relations, and the general principles of physical geography should be studied by observation and given wide general application. Commercial and political geography, meteorology, and political geography should also be outlined. The method should develop general outlines to be filled in by reading from various sources.

This work should be rather intensive during the first part of the seventh year, giving place to the general historical study of man and the outlines of the natural sciences.

6. Throughout the studies, the teacher may often use various devices for greater interest and securing wider views. In the first stages, inter-school correspondence, the exchange

of illustrated postals, postage stamps, of local products, of local photographs taken by the pupils, of mounted specimens of plants, flowers, insects, minerals, and woods are of great value and more or less easily accomplished.

7. The mental development of the child and his interests must mainly decide the method to be used and the nature of the material. The interests in each grade are sufficiently broad to be made to include all the essential facts, and to create wider and deeper interests, which may be made into correlating centres in learning.

In the seventh grade the logical order of the development of the subject, connecting the facts about the larger general causes of physical geography and meteorology should be followed. In general the present order of teaching the subject by beginning with physical geography and the development of land forms and attempting to base the descriptions of plant and animal life upon these must be reversed and the study centre first about observation of human and animal life, especially at first the life of the individual child, and go out from this to life in other conditions and countries, including at first only incidental references to causal relations, especially morphology of surface forms, but making this an important feature in the last year of study when the pupil has the mental ability, the stock of ideas, and the interest in and necessary for this method of procedure.

The use of the methods as outlined in general above will give the subject greater unity in the child's mind, greater interest, give the subject a very high cultural value which is now largely lacking, besides greatly reducing the time now given to it, leaving opportunity in the upper grades for a study of the outline of anthropology, general history, and the natural sciences.

6. The Materials of Instruction. It has been pointed out how the common school geography has come to contain, first, the general topics and arrangement of the older cosmographies, and second, many facts belonging to other sciences. In the choice of materials the stages of the development of the child and his capacities and interests and the natural order of development of the subject must be considered. Geography as a university subject does require a wide knowledge of many subjects, and it has been a great mistake to push the methods and requirements here in miniature down into the lowest grades of the elementary school. The observational and descriptive stage must precede the general application of the Baconian method of inductive and deductive reasoning. The historical development of this method corresponds in general to the natural development of the mental life of the child, so that

the choice of materials, according to the latter, is also equally well suited for the development of geography as a science in the later stages of the work. It treats the subject as a whole more by a general inductive method and is far more pedagogical.

In the above discussions, the order of topics and the materials of study have in general been pointed out. They need here be given only in outline. An additional factor, not mentioned in the preceeding discussions, should, however, be presented. It is generally stated as one of the reasons for the study of geography that it has considerable practical value. This gives rise at once to the question, How much geographical information is generally required in the life of the common citizen? How can this be determined? Are we not teaching far too many details? What should be excluded and what included?

One might approach this by gathering the opinions of a large number of persons in all walks of life, but this has many difficulties. The elementary schools prepare the child for the life of the ordinary citizen, who uses his knowledge of geography probably most in reading the daily newspapers and monthly and weekly magazines. To determine the amount and kind of knowledge required for this purpose, an analysis was made of a week's issue of the Boston Evening Transcript and the New York Herald. These newspapers are above the standard of those most usually read by the common people, and represent a wider range of facts.

The following table gives the number of facts found on the average in each daily issue of these papers omitting stock quotations, advertisements, and strictly local matters.

	Cities.	Countries.	People.	Lakes.	Islands.	Products.
Boston Transcript,	62	34	15	2	3	5
New York Herald,	49	12	7	2	3	10

	Industries.	Rivers.	Mountians.
Boston Transcript,	6	2	3
New York Herald,	4	3	2

The facts required are mainly those of countries, peoples, cities and products. They are mainly facts of location such as can be acquired for most ordinary maps of the countries. Routes of travel, steamship lines, railroad routes and commercial factors are also prominent. These facts are not so numerous as those usually required by our grammar school geographies.

This suggests the cutting down of the number of facts to be committed by the pupil to a limited number of the more important cities, rivers, lakes, mountains, routes of travel, etc., which should be learned mainly from the map in the fifth and sixth grades, as already outlined, and completing these by de-

scriptions of the peoples and their social and economic and political conditions.

Summary. The following is a general outline of the arrangement of materials as suggested by the foregoing studies.

Grades I, II, and III. Nature study, with observation of plants, animals, minerals, weather, rain, clouds, dew, frost, snow, some of the effects of heat and cold on life of animals and plants, etc.

Observation of occupations, local means of travel, some of the local products, and foreign articles of the child's personal needs and comforts.

Stories of children, people, and animals in other countries in contrast with the personal experiences of the child.

Grade IV. Continuation of the out-of-door observation and nature study of the former grades, with the beginning of map representation of the facts observed, of streets, hills, streams and the town, the surrounding district, the locating of facts connected with nature study and local history. Some idea of the globe and the condition of the continents, derived mainly from the continued reading of peoples, primitive life, with more emphasis upon their occupations, food, customs, and homes.

Grades V and VI. The work up to these grades should be mainly supplementary to reading and nature study. It should include a general study of land and water forms and their representation on maps, map studies of the various continents and countries, including locations, comparisons of as many important facts as can be represented by clear graphic methods, the learning of the important cities, countries, rivers, mountains, products, in connection with map study and the reading of general detailed descriptions of the various countries and of various important topics, of travels, voyages, and discoveries.

Grade VII. Review of the facts learned by observation and description, reading and map study in large units, and causal relations, the elements of physical and commercial geography and meteorology, with an outline of the anthropological development of man.

Grade VIII. The outlines of general history, the general history of the earth including plant and animal development, and some of the more important topics of the natural sciences.

7. MAPS. The study of maps is of much importance in geography. Most geographical facts can be shown on maps or inferred from facts shown on them. The teaching should be done from the map, and not the map studied by the pupil mainly from questions in the text. The pupils must be taught how to read, how to interpret. Map study should be made more vivid by description, comparison, historical or literary relations, furnished by the teacher or read by the pupils.

Each geographical feature shown on the map, as hills, mountains, rivers, valleys, etc., should have been learned in a representative way by experience. "First the pupil must learn to translate reality into the map, and then learn to conclude reality from the map." (57-314.) The model forms an important intermediate step between the feature observed and its first representation on paper. For the introduction to the map study of a district, the following three steps form an easy and interesting transition: First, a perspective view, as of a village and its surroundings as seen from an over-looking cliff; second, a picture map of the same district, giving the ground plan of a map with the objects drawn in; and third, a map showing the location of each important object shown in the picture and on the picture map, and represented by some distinguishing sign. These first maps must be on a large scale, with a limited amount of detail.

Relief maps, as generally made by shading, are difficult to read. The use of a greatly detailed relief, such as the Howell relief maps, is unwise for untrained students. A photograph of a shaded model, in proper light, makes a good relief map for the text-book. For the wall map shaded reliefs must generally be used. A number of noted teachers have had constructed large out-of-door maps, illustrating curvature of the earth's surface and many other features on a large scale. These maps serve to make the whole much more real, and may be used as the basis for many geographical games. Such maps are being used successfully in teaching geography to feeble-minded children.

The maps should be accompanied by sets of pictures giving more detailed ideas of the scenery, cities, people, occupations and products of each more important locality. The use of the lantern is one of the most effective ways of illustrating the map studies.

The wall maps should be supplemented by an atlas for the use of the pupil at his desk for reference and study. This should contain copies of the important wall maps, shaded relief maps, picture maps, outlines for map drawing, and many diagrammatic maps serving to make the subject objective. In general, the important facts represented on the map should be very prominent. Maps in this way show at a glance what many words could not express so clearly or impress more permanently. It should be borne in mind, however, that many children are not eye minded and have not the power of long retaining mental map pictures. For such pupils, the use of description and narration, accompanying the map study is a valuable aid.

The text must supplement the maps and not generally repeat

the information found on the maps. The teacher must teach from the map, and by her skill and fullness of knowledge of the subject make the pupils see clearly and broadly, state accurately, compare, and infer correctly.

8. MAP-DRAWING. In many of the courses of study and in the replies of superintendents and teachers, map-drawing is rated as very important. In the history of teaching geography there are to be found a number of important teachers who made map-drawing the basis of instruction. It cannot, however, be rated as relatively so important. Very few pupils in later life are called upon to construct maps. The pupil who throughout is required to construct his own maps from a copy or from his own imperfect images, is as likely to be impressing error as truth upon his mind, so that the method carried to this extreme largely defeats its own end. Map-drawing is, however, of value for reviews and in fixing outlines and prominent facts. Copying is a valuable exercise to give a more vivid picture, but copying should be done from special maps in which unimportant crooks in rivers and coast lines are omitted. The pupil should learn to sketch free-hand, with bold strokes and without geometric framework, the general outlines of the continents, locating the most important rivers, mountains and cities. For the study and review of special topics, the filling in of printed or mimeographed outline maps by the pupils is a profitable exercise. Children are interested in map drawing, mostly in the ages represented by the sixth, seventh and eighth grades. It is mainly then a delight in the mechanics of copying, embellishing outlines, using colors, and to some extent locating cities, rivers and mountains. Interest in accuracy is rather interest in accuracy of copy than in measurement.

For years it has been insisted that the pupil shall begin his map study by construction to scale of plan maps from actual measurement. This method is followed in most courses of study, in the practice work in most normal schools, and in most text-books. The method usually begins with making diagrams to scale of the tops of tables and desks, then of the schoolroom and the school grounds. This work is usually begun in the second or the third year, before the pupil can have any adequate idea of working with common fractions, such as arise in making measurements and reducing them to scale. It seems to be generally thought that the pupil can have no idea of a map unless he first learns to draw a diagram map in this way, while the fact is that the maps which the pupil draws are not geographical maps at all, and at this period he can make little or no use of a scale map to find the distances. Why should we mention "scale" to the child until he is capable of understanding and making use of it. When

a child first draws the face of a man he does not have to be told that what he draws is not the head of a real man, that the head of a real man is much larger than the piece of paper, that his drawing must be so many times smaller than the head, that this ratio is the scale, and that he must never draw a man's head without first getting the scale. The child knows whether the eyes are too far apart, the mouth too large, or the ears too long. In most cases, such a drawing is a map, but surely no one would contend that to understand it, a conscious idea of scale is necessary. The child's eyes, his sense of proportion derived from experience, is sufficient scale. The same is true of the first map study. If the first maps represent things familiar to the child, he will have no difficulty in interpreting them. His general sense of proportions and relations is sufficient test. The first maps should be free-hand diagrams, but the first maps for his study should be accurate and thoroughly adapted to his experiences and surroundings.

9. TEXT-BOOKS. In our review of the history of geographical text-books, we have pointed out the main characteristics down to the present time. It has also been shown that the text-book is of very great importance in determining the materials of instruction in geography and the arrangement of details in the courses of study.

The latest books have scarcely been more pedagogical than many of the first. Physical geography and morphology of surface forms, to the extent carried in some recent books are less pedagogical in the first stages of the work than the learning of lists of names, and perhaps less practicable. In a recent book, now widely used, pupils in the third grade are required to understand how harbors are formed by sinking coasts, how rivers build flood plains, causes of the circulation of winds, and factors entering into the control of industry and commerce. Some of the rudiments of these things may be observed, but the authors disregard the child's mental perspective. We have seen that the child has very little interest in these things until a much later grade. Moreover, he has not the power of imagination nor mental grasp to carry out the stages of development or to infer remote consequences from present causes. Neither for mental discipline nor for culture can the introduction of these physiographic processes into the first stages of geographical study be justified. Where the cultural value of a subject is the more important, the best guide to selection and arrangement of topics is the generality of children's interests and development.

With the exception of a few minor differences, all geographical texts now in general use in this country are the same. They follow practically the same order, and give about the

same amount of space to each continent, country or topic. They generally lack interest. They are summaries, encyclopædic, lack unity, coherence of topics, and the real life of real pictures. Dr. G. Stanley Hall, a few years ago, found that, in three of our leading geographies, on the average, Astronomy was mentioned in 13 different places, Geology in 29, Botany in 21, Zoölogy in 34, Anthropology in 19, Industries and Occupations in 30, Trade and Commerce in 19, Buildings in 14, Politics in 11, History in 17, and Cartography in 33, making in all 275 fragments of 12 departments of learning. He concludes that such teaching is a sin against the unity of the child's mind, against the stages of the child's development, and against the law of inner coherence. It gives too much prominence to association of contiguity merely. E. C. Ravenstein states that some geographies in use in England require the learning of 17,000 words, names and facts. (61-163.)

The general demand now is for simplification, the cutting out of non-essentials, the enriching of the chosen materials so as to give them high cultural value, and more coherent arrangement and association of topics, more in accord with modern pedagogy.

We have indicated the general stages of development of the child's mind and the main interests in geography in each of these stages, and used these as determining factors in the choice of materials in the course of study. The development of the text-books should follow this outline and be the basis of the course. The books must be relieved of most facts relating merely to location, and give far more material for reading, real pictures which have true local color and will give the pupils some of the culture of foreign travel.

We must do away with the present choppy text-book, which is neither an atlas nor a means of culture, but must be supplemented to be of most value, and substitute for it a series of books giving a large amount of fresh material.

The first books will describe the life of peoples, stories of how they live, their homes, food, and clothing, and contain stories of animal life, primitive culture, with some reference to simple occupations, and land and water forms.

In the fifth and sixth grades the books should give a rich description of the continents, countries, and peoples of the world, giving the main facts of descriptive geography, and representing considerable detail. The cultural element should predominate. The books should be descriptions written on the ground by a specialist, or in part, of selections made from the writings of great travellers or other classic writings. The pupil must get true pictures and correct impressions. The descriptions may be embodied in part in selections from accounts of

great hunters, of voyages of discovery, or of great explorers. The books should be well illustrated, handy volumes, and accompanied by an atlas covering the development of the work for these and the following grades. The books should at least contain outlines for reorganizing the facts learned in the various descriptions into unified wholes.

Such a series of books would cost no more than the present text-books with supplementary readers, and would have considerable cultural advantage over the present methods. This is well illustrated in the following papers. The contrast is striking, and seems to be directly due to the difference in methods of teaching by text-book mainly or by text-book with emphasis upon much reading. This difference is not due to locality, for it was shown almost equally as well between two schools in one town in which one teacher taught the subject as a culture subject and the other as a text-book subject.

Boy, age 11, Grade V: "I would rather go to New York and see where all the cars go and what they have in the stores. Then I would like to go to Boston, and see five or six cars right back of each others and see the Capital of Massachusetts."

Boy, age 11, Grade V: "If I had the privilege of going wherever I wanted and see whatever I wanted, I would go to Rome and see the ruins of ancient buildings and sail up the Po river to Genoa and see the home where Columbus used to live.

"And then I would go to France and see the silk worms the vineyards and silk factories. I would go to Paris and climb a lofty tour and look over the city and go see the coast.

"Then I would go to Chicago and see the greatest reilway centre in the world. there I would stock yards and grain elevator and lumber yards.

"Also I would go to Ireland and see the castle and green hills. There I would the linen factors and I would go to London the greatest city in the world and see the London tour and the King queen.

"Then from their I would go to California; there I would see the orange grove and fruit orchards and see the giant trees there I would go to golden gate and see the ostrich farms and U. S. Armay.

"Next I would go to South America and see the men gather sap from the trees. There I could see the boa constrictor and with that I would be more than satisfied."

Many pupils show a lack of interest in the wide world, narrow personal views, the lack of imagination, geographical stupidity which arises from the mere cramming of dead facts in contrast to a wide interest in peoples, countries, scenes, occupations and a fund of knowledge of considerable cultural value acquired through reading. This is akin to the culture of travel which we are accustomed to regard as the finishing touch necessary to a complete liberal education.

In the seventh grade the general facts learned in grades five and six should be reviewed in large units and by causal relations, giving some attention to physical, commercial and po-

litical relations. This should be supplemented by a general outline of anthropology.

In grade eighth, as a natural outcome of the work of the previous grades, the pupils should be given the broad outlines of general history, and of the history of the earth with plant and animal evolution.

10. The Value of Geography.

Geography by the older methods cultivated the verbal memory. More recently reason has been made prominent, but the number of facts to be memorized has not greatly diminished. Geography, when taught as outlined in the foregoing discussion, should strongly cultivate observation, reproduction and representation, imagination, and inductive reasoning. It should broaden the sympathies, and give the student a larger idea of his relations to other peoples of the world. Strabo wrote "In addition to its vast importance to social life and the art of government, geography unfolds to us the celestial phenomena, acquaints us with the occupants of the land and ocean and the vegetation, fruits and peculiarities of the various quarters of the earth, a knowledge of which marks him who cultivates it as a man earnest in the great problems of life and happiness." (85-Vol. I, 1.)

The facts of geography are of value in the study of a number of sciences. Geography is indispensable in the study of history, and of many economic and social conditions. A knowledge of other countries, their people, customs, government, climate, products, topography, means of communication, etc., are essential for commerce. Economic progress, which is the basis of all progress, is largely dependent upon geographical factors. Diplomatic and international relations are very greatly influenced by the amount and kind of geographical knowledge possessed by the peoples of the countries concerned and by their officials.

Further, a knowledge of geography is of great cultural value. It broadens the sympathies, overcomes racial and national prejudices, and makes the student a citizen of the world. The modern development of means of communication and travel, the great increase in the needs and wealth of nations, the centering of great national questions about educational, commercial, and racial questions, make a general knowledge of the geography of all countries and peoples necessary. No one thing will do more for universal peace of the world and the progressive development of the races, than a sympathetic knowledge of their peoples, their habits, customs, conditions of life, their social and economic advantages. In the words of Herder, a student of mankind, geography "sharp-

ens the sense of humanity in all its forms. It teaches us with enlightened eye to see and to prize our advantages without thereby despising or condemning any one nation of the earth." (51-58.) In no time in the history of civilization has a knowledge of the countries and peoples of the world been so necessary. Many of our greatest national questions to-day are retarded in their just and amicable settlement by the general ignorance of the masses of the geographical facts involved. Moreover, this general relation of geography to national development is sure to become more important in the future. Heretofore man has depended mainly upon the productiveness of a few alluvial plains and ore-producing sections, but in the future the whole world will be laid under tribute. This will require a more careful study of man's relation to surface, climate, productiveness, and of the possibilities and special fields of development of the various races.

Summary.

1. The development of geography historically and of geographical text-books shows that there has been very little change for several centuries in the kind, amount, and arrangement of facts presented as materials for instruction. The recent emphasis upon man and upon causal relations has made some change in the arrangement of materials, but very little improvement in adaptation to the child.

2. The history of the methods of teaching geography as outlined by the great teachers in educational history shows that the necessity of adapting the materials and methods to the child was recognized early, even by Strabo, but has been very little heeded in actual practice. The practice has been mainly in accordance with the arrangement and methods of the text-books.

3. Present general practice in Europe shows a mixture of good and bad methods. The emphasis upon observation and self-activity has come to mean home geography, but this method is used mainly only in the lowest grades. In this country observation out-of-doors in geography is limited to the third and fourth grades. In only a very few places has this work been made progressive and continued throughout the course.

In European countries and in this country in the secondary schools geography is without field work, without contact with life, with the main feature studied. The course of study should include commercial geography, and be closely connected with geology, history, and biology. The pupils should have sufficient work in the field to be able to interpret a landscape and note the relations of life to topography.

4. In the normal schools the separate courses in methods, general geography, and physical geography, in the two years' course, at least, should be combined into one course, taught by the teacher of geography. This course must cover the same ground with the same methods that the pupil must use later in her schoolroom, but in connection with each topic she must learn the wider interpretations, and gather a rich fund of materials for illustration in her future teaching. This will give unity to the work, save much time, give the pupil opportunity to acquire new facts, arrange, and illustrate them so as at once to be of value in teaching.

5. Geography in colleges and universities has reached its highest development in Germany, but is rapidly taking its place with other natural sciences in all important European countries, and in this country. The problems which it investigates require a knowledge of the natural sciences, and of historic, economic, and social progress, and are increasing in importance with the advance of civilization.

6. In the elementary schools, the work is too closely limited to the text-book with very little regard for the pedagogical order and methods of adaptation to the child. The results of special studies of children, and of children's interests in geography, show in general what are the mental characteristics and interests of children. These results may be taken as suggestive bases for the choice of methods and arrangement of materials in instruction in geography in the various stages of educational life. Thus, taking into account these facts as well as those derived from the historical studies, courses of study, text-books, and the methods of teaching are outlined. All are adapted to the child. Greater unity is secured. The time is shortened. Fewer facts are given to be memorized. The cultural value of the subject is increased. The present methods are reversed by beginning with life elements and reserving for the last the emphasis on physical and causal relations. Arranged according to these principles, established by modern pedagogy and psychology, geography will be one of the most valuable of school subjects of study.

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A PRELIMINARY CRITIQUE OF THE DOCTRINE OF FUNDAMENTAL AND ACCESSORY MOVEMENTS.

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We hear much nowadays (2, 3, 32, 23, 30) in criticism of practices in our schools that involve the early use and too great use of the finer muscles, and the neglect to provide for the corresponding action of the larger muscles of the body. My own tendencies of thought were quite definite along this line. But when I attempted to give reasons for my belief that would stand the test of scientific criticism I could not give such reasons. This study was attempted with the hope of finding definite evidence and material for a constructive criticism of our curricula, methods, and administration with reference to the development of fundamental and accessory muscles. It is only fair to state at the outset that as this paper begins with questions, so it closes with questions; and so becomes not a thesis but a study preparatory to later ones.

It is not hoped to make any contribution to the science of education, but rather to make more definite the limits of knowledge (or of ignorance) so as to set off some of the things that are known from what is believed. The writer's motive is fourfold. 1. That such opinions as we school people should hold might be more satisfactorily formed, based upon what is known, with a consequent result of greater faith in such opinions.

2. That we might regard certain *other* opinions as of a decidedly tentative nature and be on the lookout for evidence that bears upon the questions involved.

3. That certain gaps in knowledge might be located for investigation, or at least, noted so that we might be on the lookout for new material.

4. That we might have, to a greater degree than at present, the questioning attitude toward all of our schoolroom ideals and practices.

The terms Fundamental and Accessory, in the somewhat definite sense in which they are now used conjointly, were, so far as I have found out, first used by Ross (2, p. 15) at least as early as the early eighties and applied to parts of the nervous system. It is very evident that any consideration of the development of fundamental and accessory muscles must almost

necessarily take account of corresponding development of fundamental and accessory nervous structure, since movement is but a function of which the co-ordinating nervous parts are a portion of the structure, and structure and function, from the evolutionary point of view, are correlative.

"The portions of the nervous system which man possesses in common with the lower animals and which are well developed in the human embryo at nine months," Ross (8, p. 69, and 8a, p. 84) calls "the *fundamental* part; and the portions which have been superadded in the course of evolution, which differentiate the nervous system of man from that of the highest of the lowest animals, and that are either absent in the human embryo, or exist only in an embryonic condition," he calls "the accessory part of the nervous system."

He says (8, pp. 68-69, and 8a, pp. 83-84): "The main movements which distinguish man from the lower animals are those concerned in attaining and maintaining the erect posture, the varied movements of the hands as organs of prehension, the movements of voice and articulation concerned in speech and those which are active in the production of facial expression. All these movements must, therefore, be represented in the human nervous system by structural arrangements superadded to those which man possesses in common with the highest of the lower animals. Indeed all the complex movements first mentioned are acquired considerably after birth of the human infant, and we may consequently expect that the structural arrangements corresponding to them either do not exist at birth or exist only in an embryonic condition."

Such expectation has been realized. "Die Functionsfähigkeit einer Nervenleitung, ihre Fähigkeit Reize fortzuleiten an das Vorhandensein einer isolirenden Markhülle gebunden ist." (17, p. 227.) The investigations of Flechsig *et al.* (2, pp. 11, *et seq.* and 3, p. 234) have shown that the fibres connected with the centres that control reflexly the fundamental movements are medullated before birth, while fibres connected with the higher centres are not so medullated.

G. Stanley Hall (5, p. 154; *cf.* 19, p. 510) classes as accessory the movements "of the hand, tongue, face, and articulatory organs," thus agreeing with Ross except that Hall does not include the movements that have to do with erect posture. As a schoolroom problem we might, of course, eliminate from our consideration this non-included group, since the children when they come to us have already attained the erect posture, although, as we too sadly notice, at times they do not maintain it with sufficient exactness.

But why, when they are listing the accessory movements, do these leaders omit the fine muscular adjustments that come

with active attention? To me they seem as distinctively human as do the movements of the hands or of the larynx. One of the conditions that modern psychology has emphasized as a requisite for active attention is the muscular-tension-preparedness (44, 47). There is no indisputable evidence that animals, or children before they actively attend, have the muscular strains that you and I feel in the fine muscles used in attention, often especially in the scalp—particularly in the parts of the scalp covering the forehead and the occiput (7, p. 386, and 24, p. 374). Many of these muscles, it is true, are facial muscles, but some of them are not—in fact the same kind of tension is felt, although usually to a lesser degree, in various parts of the body. After all, it is not the differences in the muscular anatomy *per se* that are really distinctive, it is the differences in function; and it might be better to speak of fundamental and accessory movements than of fundamental and accessory muscles.

Those that emphasize the theory of the order of development of movements from fundamental to accessory, point as a confirmation of their theory to the fact that in the degeneration that comes either through old age or through gradually increasing general paralysis of the body there is a loss first of the most completely accessory movements—those controlled by the highest centres—toward the less accessory and the more and the most fundamental. The genetic and pathological loss of control should be paralleled in the loss of control due to temporary fatigue. In the schoolroom one of the first evidences of fatigue is the wandering attention of the pupils. Dissipation of active attention can arise only when the muscular tensions correlative to mental concentration are absent. Should not the muscular movements accompanying active attention be classed in the accessory movements for our purpose? It seems to me that they should be so classed and I shall so consider them.

If nerve and muscle structures corresponding to higher functions were merely superadded as children develop, our problem would be much simpler than it is. But these accessory movements do not replace fundamental ones. They always include certain fundamental movements, sometimes with marvellously wonderful combinations of fundamentals and less complex accessories.

Dr. Hughlings Jackson (1, 8), in 1872 (or earlier) presented a theory of control of the muscles that simplifies the problem for our consideration. His theory is most often spoken of as the Hughlings Jackson Three-Level Theory of the Nervous System. The nerve centres of the lowest level are those of the spinal cord, medulla and pons, so that the movements on this lowest level would be such 'vital' movements as those that are

involved in the circulation of the blood, respiration, crying, sneezing, coughing, sucking, digestion, excretion, and the grasping acts of infants. For all these the sensori-motor apparatus is perfectly organized before birth and the sensori-motor action is typically automatic.

He included in the centres of the middle level the basal ganglia of the brain, together with the 'sensori' centres of sight, hearing, and the other 'special sense' ganglia, with the convolutions that are in immediate relations to them. These centres receive impulses not directly from the periphery, but through the ganglia of the lowest level, and the movements controlled by these centres would be controlled through the centres of the lowest level. Such movements would be produced as might be exemplified by the grasping of a thing seen, the removal of an offensively smelling object, or other like movements such as any of the higher animals, some imbeciles and rather young, normal children might perform without much thought.

Jackson's investigations were carried on in the laboratory of clinical practice, especially in connection with cases of epilepsy. He realized that his classification was in some degree unsatisfactory and he pointed out some of its shortcomings, but these two lowest levels of control were fairly well established and upon the basis of the theory nearly every phenomenon involving these kinds of control could be explained.

He went farther, however, and claimed, hypothetically, that the remaining portion of the brain comprised the highest level.

As the lowest level sensori-motor centres "represented" external stimuli in both the reception of stimulation and the motor response, and as the centres of the middle level, being also sensori-motor, "re-represented" the external world by mediation of the lowest centres and fibres, so the other centres in the cerebrum must be also sensori-motor and must, through the mediation of the two lower levels, "re-re-represent" the external world. Thus, according to Jackson's theory, every muscle of the body is represented in each of the different levels of the nervous system both as to sensory stimulation and motor control (*cf.* 7, p. 394).

It may be of interest to note that Flechsig, attacking the problem in quite a different manner, found what might be considered corroboration of Jackson's theory concerning the control of these highest centres over the lower, in that he found that the highest centres connected with both the sensory periphery and the muscular mechanism not directly but through the next lower centres. And immediately he stated (in 1896) practically the same hypothesis for the portion of the cerebrum not included in Jackson's middle level.

He says (13, pp. 22-23): "Nur etwa ein Drittheil der menschlichen Grosshirnrinde steht in direkter Verbindung mit den Leitungen, welche Sinneseindrücke zum Bewusstsein bringen und Bewegungsmechanismen, Muskeln anregen; zwei Drittel haben direct hiermit nichts zu schaffen; sie haben eine andere, eine höhere Bedeutung." And again, "Die (13, p. 24) geistigen Centren sind also Apparate, welche die Thätigkeit mehrerer innerer (und somit auch äusserer) Sinnesorgane zusammenfassen zu höheren Einheiten. Sie sind Centren der Association von Sinnes-Eindrücken verschiedener Qualität, von Gesichts-, Gehörs-, Tasteindrücken, etc.; und sie erscheinen insofern auch als Träger einer 'Coagitation,' wie die lateinische Sprache prophetisch das Denken bezeichnet hat, sie können also specieller auch Associations—oder Coagitations—Centren heissen." (See also 12, p. 112; 3, p. 176; 51.)

We should note that Jackson's theory would require that each and every part of the central nervous system should be at the same time sensory and motor. This would require that the 'motor' area in the brain should have sensory cell-elements and that the 'highest' centres should have motor elements. Modern anatomical and physiological investigations have shown that such an hypothesis is probably the expression of the truth (7, 12, 3).

The main features of the Jacksonian hypothesis have stood the tests to which they have been put. If we note especially that control (3, pp. 263-264) is exercised by each level over each part of the body, and its implication that each level is both sensory and motor, it seems to me that we might make a more helpful use of the terms *fundamental* and *accessory*, if, when we use the terms, we put more of the idea of control into their connotation. We should not then contrast so much the fundamental muscles with the accessories, central muscles with peripheral muscles, nor large muscles with small ones, nor large movements with small movements, nor few muscles with many muscles—all of which contrasts have been made by writers on the subject. Nor should we lay ourselves open to the criticism that Thorndike gives when he calls attention to the fact that one of the first movements that the child is capable of making after birth brings into play the fine movements of the fingers (36, p. 105, and 37, p. 76).

The child at birth has muscles strong enough to grasp a small rod and support its own weight for several seconds, but it has no voluntary control over such movements (20, p. 838). In fact it usually loses this power after a few days, and any one who remembers the difficulty he had in learning to hold his own weight upon the horizontal bar will realize how, had he known of his earlier powers, he might well have sighed for a retention of this remarkable Simian characteristic. Had there been care to think and speak of accessory movements in the sense of movements controlled by higher centres rather than to

throw emphasis upon size of muscle or coarseness of adjustment, such thrusts as Thorndike (36, p. 105, and 37, p. 76) gives concerning these finger and hand movements might be parried and probably would not be made. (I am taking for granted that the implication of Thorndike's criticism are true, *i. e.*, that the muscles used in this early movement are the relatively fine muscles.)

If we note the movements that are controlled by the centres of the lowest Jacksonian level we may see that they are relatively simple; absolutely indefinite *so far as control is concerned;* definitely separable as to stimuli and appropriate response; relatively indifferent to other movements. They thus have the characteristics of objects far down in the evolutionary scale. We sometimes fail to notice that "the most complex, etc., nervous arrangements, centres and levels, are the least organized; the most simple are the most organized (18).

"Thus the centres of the lowest level are much more strongly organized than those of the highest level are. . . . If vital' centres of the lowest level were not strongly organized, at birth, life would not be possible; if the centres of the highest level ('mental centres') were not little organized *and therefore very modifiable* we could only with difficulty and imperfectly adjust ourselves to new circumstances and should make few new acquirements. . . . The highest layers are the least organized, least automatic, and their activity is attended by most vivid consciousness."

In viewing the ascent in the hierarchy of control we may note that the movements become gradually more complex, more definitely under control, more fully co-ordinated and integrated, thus following the lines of evolutionary development (6, p. 98; 5, p. 154; 2, pp. 25-26). But throughout, this seems to mean the control of the same muscles by these different levels. This may be illustrated by the grasping movement already referred to. The new born babe seems to use just the same muscles to grasp the pencil reflexly as does the child of six months when he grasps the pencil to pull it towards himself and as you would do should you now, at my suggestion, grasp your pencil. And so with many, if not all the other movements. After their appearance in reflex use, if they ever pass beyond the purely reflex, they can only become compounded, or rather complexed.

Are there any voluntary acts of the adult that involve muscles that are not themselves present at birth? We know that the striped muscles are incomplete at birth, and more completely incomplete in man than in other animals (7, p. 383). We know, too, that some muscles do not function at birth, but the writer is not aware that any of the adult muscles are actually absent.

During the last 25 years there has been an emphasis upon the fact that immaturity of the nervous system at birth is a prominent characteristic of the educable animal (42, 41, 22, 10). It is the condition that makes infancy at the same time both so dangerous and so promising.

The nerve fibres necessary to the control of movement by the highest centres are not medullated at birth (7, p. 383). Flechsig, in his investigations, found that the direction of growth of medullation was not from these highest cerebral centres toward the periphery, but rather, through the mediation of the medulla, in the opposite direction. Such conditions have supported the supposition that the development of these highest centres comes through the movements in the periphery, and that gives support to the thought that we move voluntarily not because we think, but rather we are led to think volitionally because we have moved. So that Mosso (7, p. 383) is led to say that "in man the brain develops later than in all other animals, because his muscles also develop later." (*Cf.* 40, p. 366.)

It is believed that movements produce development of nervous substance. One of the most convincing instances of the development of the centres from the periphery is the "Psycho-Physiological Training of an Idiotic Hand," reported by Seguin (21). He probably believed that cortical centres for more proximal joints (such as the shoulders in contrast to the elbows) tend to relatively speedy organization and therefore become to some degree a thoroughfare for impulses controlling more distal groups. (3, p. 355.) The teacher of the idiotic boy referred to, began "the training of that hand from the shoulder by movements which, starting from the elevators of the arm, would involve successively the muscles of the arm and the hand. Thus by a series of operations, whose willed or obedient starting point descended gradually from the spine, the child became capable of moving his hand and fingers by imitation at first, and *propio motu* for simple willed operations, later."

"In the first place, the movements commanded to R. were those commencing nearer the spine; the trainer gradually extending the operations of the will (the will communicated to the pupil by imitation or command) to the groups of muscles approaching the extremities. Thus the limb in training not only became capable of a few willed movements of totality—later applicable to a great number of operations and convertible into smaller movements of the farther extremities—but the mind being drilled to be carried over regions previously ruled by automatism alone, extended its dominions and circulated as if at home, from the great centres to the most delicate groups of sensitive and contractile tissues at the periphery, and soon thence reached centripetally." "In the second place, when these reciprocal conductions between the mind and the periphery, and mainly from the periphery to the centre were taking place, the invitations to the

periphery, not only to enter in action, but to provoke the centres of intelligence, were incessant."

In one year, to quote the report verbatim, "his hand has learned to help himself, to amuse himself, not to bite itself, nor to slap his friends, though it is yet sometimes subject to its automatic agitations. His tact has been cultivated to the point of being conscious of the ordinary variations of the temperature, of water, food, etc.; and of recognizing and naming (without the help of sight) about fifty things by their shape, and quite as many by their texture. His eye—after his touch—has been drilled to appreciate the typical forms in substance at first, and later painted, delineated and hardly indicated; then to cut the same out of paper, etc. In regard to the appreciation of dimensions R. can find out objects gradually shorter or longer, and arrange them accordingly. . . . He has learned to scent, to recognize and name about thirty flowers without fail. . . . He loves the flowers, is ready to plant and nurse them, etc."

After a month's vacation R's teacher (M. E. Mead) found that he had not forgotten, but yet "his hands show that they have done nothing." "Thus, what was gained mentally through the senses—mainly through the hand—remained acquired to the mind. But the training of the hand having been too soon discontinued, the hand relapsed to its former 'lifelessness.'"

Excitation of the senses and impulses to movement hasten the development of the nerves that are implicated. "The experiments of Ambronn and Held and others (17, 4) have shown that if one eye of a new-born kitten is opened to the light, the other remaining closed, the optical fibres of the eye which is stimulated by the light are more quickly surrounded with myelin than those of the other." (Mosso (7), p. 384.)

Let us pause long enough to recall that the child starts out at birth with movements, almost all of which are of the fundamental nature. They are reflexes, automatics, instinctive movements and random movements. But before he is three months old he acts in response to sight, sound, and other such stimulations, the movements being controlled more fully by the centres of the middle level. Before he is a year old, he acts sometimes with volition—he decides, with infantile decision, what he will do. Thus movements advance from the fundamental toward the accessory, chronologically. But this does not mean that he ceases to act somewhat under the control of the lowest level. As he grows older he has learned, *e. g.*, to walk and talk, so that he no longer needs to think of how to make the step or to form the word. What has happened with these accessory movements used in walking and talking? They have gradually changed from accessory control of the highest level to that of the middle level, toward that of the lowest level, so that many of the walking movements have come under the control of the spinal cord and the bulb and so are of the fundamental nature.

To my mind this typifies a direction for much of the educative process, and so it seems to me that Hall is only partially

correct when he says (5, p. 156): "Nature and instinct determine the basal and education the accessory parts of our activities." For education founded upon the basal determines the final basal as well as the final accessory parts of our activities. It determines what ones of our accessories shall be solidified into basal ones and what ones shall be combined into more complex accessories. If the child could be permitted to recapitulate racial history, he would need no other education than that that he would get in such recapitulating. But racial history has made possible his congenital fundamental movements, and that he may survive and be properly adjusted in the complex environment in which he is placed he must get possession of himself, or rather he must give over to the direction of his spinal cord many of his movements so that he may use his higher nervous centres in the management of the very complex situations in which he is to be placed. "L'éducation est l'art de faire passer le conscient dans l'inconscient (45)."

The child must take many "short-cuts" in his recapitulation and should remain in the lower stages only so long as he needs to remain there in order to make the successive stages of his development secure (39, 5, 42, 41, 43).

The experiments on the prematurity of the optic nerves of cats, rabbits, and dogs have shown that maturity can be hastened. But there were some side results to these experiments to which our attention has never been called, so far as I am aware. I have in mind the induced pathological condition of at least some of the animals as a result of the experimentation. Especially was there in evidence a soreness of the eyes. Again, so far as I know, no animals have thus been experimented on and been permitted to live to see if, after maturity, they were as efficient as other animals that have developed normally. Was Preyer's child, for instance, as well off, better off, or worse off than he probably would have been had his eyes not been prematurely developed? To my mind, this points to the real question at issue for us along this line. It is not what *can* be done, but what is it safe to do in putting the child into possession of adult powers early? As an application of this thought, I notice that Patrick says we should ask, "Not what *can* the child be taught, but what studies for him are most rational and therefore most economical?" (33, p. 387.)

We hear the complaint that the preparation for college takes too long. It is said that we should hasten the development of the children. Surely we could not permit the child to recapitulate all racial history if we would, and we would not if we could. Short-cuts are both necessary and desirable. What is the limit of safety in acceleration of control? My belief is that we have already exceeded the limit of safety in this accel-

eration; but my search for evidence reveals none that is incontrovertible. The tangible fibres in the highest brain centres increase in number and complexity contemporaneously with increase in intelligence. The accessory movements are those controlled by these highest centres. The more completely these centres are developed the more complex may the movements be. If the development of the brain centres is brought about through movements, why not hasten the development by the use of these accessory movements? Is not the development, at least at some times, brought about in this way? When the child is learning to write, for instance, he is learning to make accessory movements. In doing this, his nervous impulses are so diffused that he makes many unnecessary movements (35). Such a decidedly conventional mode of expression in orthodox form could never be mastered in ontogeny by any other means. That it so unnatural to children is what makes it so difficult to learn. They must have many movements from which to select the effective ones. The mode of learning is not changed materially (48) by changing the learning to a slightly earlier or a slightly later time in the child's development. May not the use of these accessory movements be a means to increase the control and to shorten the time of obtaining control? And if so, what is the limit of safety in the use of this means for this end? Again, although I believe that in this also we in our practices pass the bounds of safety, I find no indisputable evidence.[1]

But there is one phase of the question that at first seems to give some gleam of light. There is no need of experiment to show that there is a period in ontogeny when the individual is too immature to learn to do certain things—he cannot learn to walk when one day old, and if he should live to be a very old man, there would come a time when he could not learn to do a similarly complex thing. Between these limits of almost infinitely great and almost infinitely little plasticity there are variations that, in the main, change in degree as the individual gets older. It is said that there are certain times that are "ripe" for the learning of certain things. Whole chapters and books have been written on Instincts and Habit and the general truth is recognized. But just when do these tendencies come? Exactly what are their evidences? What is the limit

[1] Consideration of further practical problems in schoolroom practice are omitted for the lack of time. Such are excessive fatigue and nervousness due, it is alleged, to accessory movements in the fine adjustments of attention with visual and auditory stimuli; inability of children to be still (*vide* Hancock (16)); of increasing myopia and astigmatism in the ascending school grades; of increased chorea at examination periods; of possibly greater strain and a strain of possibly greater consequence on girls than on boys, etc., etc.

of safety in prematurity? etc., etc. These questions have not been answered. "If we knew just the times when the different anatomical concords were developed, and on just which of them the different movements used in reading, writing, drawing, manual training, sewing, etc., depended, we could so plan our courses of study as to take the tide of nervous growth at its full. We could avoid premature efforts that would be bound to end in failure. We would save children from learning with difficulty and danger things they might, earlier or later, learn with ease and profit! We do not know the times when the different concords are developed, or even their order." (37, pp. 75-76, and 36, p. 104.)

A few major studies, however, bear upon the order in which certain muscles come into accessory control and the approximate ages at which this control takes place.

W. L. Bryan (1892) (11), in his study of voluntary motor ability, dealt chiefly with "(1) the maximum rate of rhythmically repeated movement and (2) the precision of voluntary movement, particularly as regards direction and force," noting also "the bilateral development of strength and endurance." All of these points bear upon our problem. One result is readily seen from the records of his tapping experiments. The direction of control in tapping is very evident. Control over all joints usually increases with age, but the control over the hand increased later and increases more than does the control over the arm.

Related studies showing similar tendencies were made by Gilbert (14, 15) at Yale and at the University of Iowa.

"The child's hand at the age of commencing school is relatively immature in power of rapidity of movement, strength and precision. Roughly it would seem that at the age of six the child has acquired only about 20 to 75 per cent. of the power at sixteen years of age. It is clear that the period from six to ten years is one of extreme nascency."

In an imitative tapping test on 162 children between the ages of five and seven (1st school year) Hancock (16) noted that "five succeeded somewhat slowly in tapping correctly with both hands; four were successful in the right hand only, and three with the left; fifty tapped with the whole hand, using a wrist motion; nine with the whole hand, using an elbow motion; five with the whole hand, with both an elbow and a wrist motion; forty-nine alternated the index finger with the other three; seven of these, however, did this with one hand only, the movement of the other hand being with all the fingers moving together from the knuckles; twenty-five gave irregular movements, indefinite and uncertain, but in many instances approaching success; in twelve cases the movement was from

the knuckles, all the fingers moving together." This shows a tendency to use the muscles of the forearm and wrist, even though the suggestion was for the use of the finger muscles.

In needle-threading, string-tying, and beating time experiments there was evident the relative difficulty or even inability to control the finger muscles, and the corresponding ease and ability to control those more nearly central.

Gulick (29, p. 800) says that "unless influenced by adults, children do but little fine work with the fingers and wrists, not very much involving delicate co-ordination. The movements are the larger movements of the trunk, shoulders, and elbows."

Of course every child is, fortunately, influenced by adults, and we hear statements made by supposedly competent observers to the effect that children naturally do "fine work with the fingers and wrists." Are these observers careful to use media that do not suggest the use of the fine muscles? What muscles do children use in their free play? How much co-ordination do they employ? What forms does the co-ordination take? How does it vary with age? How does it vary with certain definite changes in environment?

"No one has proved that any of the nervous basis necessary for the associations involved in the reading, writing, drawing, cutting, pasting, measuring, modelling, sewing, etc., commonly taught in schools, is delayed in appearance till after the fifth birthday." (37, p. 76, and 36, p. 105.) But we should not forget that the mere possibility of development at a certain time does not warrant the development at that time.

My own belief is that after the age of about seven or eight, or rather after the readiness-to-fatigue time has passed, when the rate of growth lessens, when the organism is relatively stable and the health is good, when the brain has practically attained mature size and weight, the training of the brain should be systematic and kept up in earnest; then should come as *tasks* most of the drill in reading, writing, arithmetic, sewing, weaving, drawing, modelling, etc., etc., using the more complex co-ordinations of muscles. Not earlier, else forcing is liable to produce arrest of development;—not later, else we shall lose the reactionary effect of muscle on the brain—we should have a part of the body not functioning and so liable to practical atrophy. For "cells which fail to react during the proper growing period of an animal have lost their opportunity forever" (3, p. 37; 28), and it should be borne in mind that "the time required to accomplish a change of a given extent increases with the age of the organism." (46, p. 87.)

"We know that the child's strongest characteristic is activity, and yet how little do we utilize his activities in teaching. We are remiss in this principally because we do not know just

what activities to utilize, nor do we know what sort of occupations will utilize the activities he possesses." (34, p. 39.)

Just what activities *should* be utilized? How shall these activities be utilized in producing such control over the child's experiences as will make him socially efficient? Dewey (25, 26, 27) *et al.* are giving answers. Are the answers that have been given adequate?

Fortunately in the absence of definite scientific data upon which to base our practices, we must still keep on in the work. I am inclined to think that Thorndike (37, p. 78, and 36, p. 107) gives good advice when he says:

"The best practical attitude of the teacher of children 6 to 12 to take would seem to be to find out, by trying, the most economical time to teach the movements he wished the children to know, and to make sure, again by trying, that they do not hurt the children's health. Whether they will or not cannot be told beforehand by any theory about the development of the brain by virtue of its inner growth, but only by observing directly the signs of brain exhaustion."

Kirkpatrick (31) says: "Tests that would be of value to the ordinary teacher in determining the adaptability of her daily programme to her children, and in discovering exceptional instances of fatigue in the school or in individual pupils, have been sought for several years. It may be safely said, however, that no method of discovering fatigue, that can be mechanically applied by a teacher, has been found. Such tests cannot take the place of intelligent common sense and good judgment on her part. She must be not only able to note the decrease in rate or accuracy of working, but must also learn to read the signs of on-coming fatigue in the pupils' attitudes and movements." (*Cf.* 38, p. 213.)

From this study there have come six results of value at least to the writer.

1st. There has been emphasized the great desirability of especially considering the *control* phase in the distinction between the fundamental and the accessory movements.

2nd. The *movements* that *accompany voluntary attention*, it seems to the writer, should certainly be included in the distinctively accessory movements. They are characteristically human and have, in a marked degree, all the characteristics that Burk (2) finds in accessory movements, viz., they have "infinite variety" in contrast to "extreme fewness;" "complexity" in contrast to "simplicity;" "precision" in contrast to "clumsy inaccuracy;" they exist in "a long series in sequence" rather than in "simultaneous association;" they are "specialized" rather than "generalized."

3rd. Apparently we must recognize that movement in education is not wholly from fundamental to accessory, but that a portion of it is from accessory to fundamental in the development of ontogenetic habit.

4th. The importance of the motor phases of schoolroom activities are re-emphasized.

5th. One is greatly impressed with the lack of knowledge concerning the plastic periods of children for different kinds of impression, and with this the ignorance concerning the dangers of too early, too late, too much or too little use by the children of certain mental and physical activities.

6th. In the absence of such knowledge, and knowledge along related lines, we must act in the practical situations which confront us in our schoolrooms. Thorndike's advice (already given on page 112) should be emphasized, with the suggestion that we are not liable, at present, to err on the side of too long delay in the introduction of accessory movements by the children, nor of having the children use them too little. *Waste in education will be eliminated not so desirably by attempts to shorten the period of infancy as by utilizing this plastic period in such manner that the reactions that we desire to have fundamental may become so thoroughly engrained as habits that much more of the energy of the mature individual may be utilized in the accessory control necessary for effective service in this complex environment.*

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IS LANGUAGE A LIVING THING?

By John Bascom, LL. D.

Mr. Henry Holt furnished, as those who are readers of the Independent will recollect, an ingenious article to the effect that the annual loss attendant on the perplexed spelling of English approaches $100,000,000. If this sum could be picked up by any definite number of people, at any one time and place, in any current form, it would certainly create a scramble. But if we are to hunt for it, as for a gas that has escaped into the air, hardly aware of its presence when we have found it, the case is less pressing.

It seems to be a mistake to look upon life as having certain labors to be performed in an exact and mechanical way, and have done with them. It rather falls to each of us to fuss with our undertakings and fool with them till we are weary and then pass on and leave them to the next comer. The losses by ignorance, the losses by accident, the losses by negligence, are enormous, a much larger percentage of waste than can even be thought of in connection with bad spelling. We can hardly get a machine in good running order before it is superannuated; our big warships go to the bottom without firing a gun; our cities are pulled down and rebuilt long before the utility of previous toil is exhausted. Indeed, the more thrifty any man or community is, the more rapidly does the process of destruction proceed.

Printing, throughout, is one of the most wasteful of our activities. It would seem as if a large half of what we print was destined chiefly to consume material and time. Even the use of a grand library is largely ideal, only reached at long intervals. A great daily of twenty to forty pages reaches many eyes. Not one word in five hundred is of any interest to those who see it; nor does one word in a hundred subserve any definite use for those who read it.

Nor would the simpler spelling be all economy. We should be compelled to fling aside a lot of superfluous knowledge, very considerably increase our alphabet and acquire new skill in its use. If we are to have a single character for every single sound, we must familiarize ourselves with the tick of this new telegraphic message. Nor are we at all sure that our loose, frayed-out methods of thinking would take kindly to this exact

reproduction of the symbols of thought. We should doubtless find new ways of a mismatch, or, in lieu of it, become as stiff and mechanical as the instrument we were employing.

As things now are, it is hardly possible to bring our language up to the precision required of it. There is so much that is loose in speech that its reproduction in print must be somewhat careless. Our vowel sounds in unaccented syllables are indistinct in enunciation, and a half-dozen of them stand ready to do the same duty. The poor speller cannot tell, on any given occasion, which to call in. When the kindly teacher pronounces the word, syllable by syllable, making every part of it accented, the pupil may find his way through it, but the moment the word slides into its proper utterance, his knowledge disappears. Our speech is incapable of exact reproduction, it is not exact in its living form on our lips. Its slurred portions we may fill in as we choose. Such terminals as or and er, ance and ence, ible and able, play hide and seek with each other because they are on masquerade with no distinguishable difference of service.

Much the same may be said of double letters. Rarely does the pronunciation lead us to the correct result. Either form satisfies the ear. It is easy words that cost the poor speller the most worry. The vowels are all at loose ends, and a single l carries him as far as a double one. The discipline of learning to spell is not all lost. The ear and especially the eye are made more attentive, and one's intellectual feet are placed somewhat more squarely and firmly in the realm of language. It is in phonetic spelling itself that different persons, like poor skaters, slip about haphazard. When we can see thorough spelt thuro and not feel that we have driven over a stone, we are in a frame of mind suitable for reformed spelling. The instinct of surefootedness in the world of sounds is no more a thing to be learned than is the instinct of direction in a forest or a city. In both cases we approach an important primitive frame of mind.

We have reached the question we first propounded, is language a living thing? Or is it a mechanical thing which can be shaped and reshaped till it renders the same adequate service to all comers? That it can be somewhat helped by skillful criticism we make no doubt, but this is not the whole story. It holds in reserve its own secrets, which we simply explore. Language is not a living thing as a plant or an animal is a living thing, but a living thing as a branch or a brain; the product of organic activity elsewhere exercised, or the result of mental processes which have been pursued with no immediate intention of affecting structure. Language is the product of personal and national life, and takes on fullness and form pro-

portioned to the service required of it. Language is not first shaped and then made the instrument of thought. Expression arises in and through language, and the two come into being together. The Greeks made the Greek language, and the language in turn made the Greeks. We do not suppose that the irregular forms of nouns and verbs were so many defects in the machine, but more often so many achievements, so many shorter routes by which the mind reached its goal. If we wish to make the brain more facile in any direction, we can do it only by repeated effort in the line required. No organic process submits itself absolutely to a mechanical use. The mechanic handles his tools, the writer his pen, the painter his brush with a knack of execution wholly his own. He rejects any rule which embarrasses his own instinctive effort.

The higher we go the more guidance do we find in the organic tendency. Spelling is more mechanical than pronunciation; pronunciation is at once suffused with inner light and color. We can no more frame advantageously a spelling which is henceforward to control pronunciation than we can frame a delivery which shall suffice to express the temper, the moral temperature, of the human soul. The rules of grammar must rest a little loosely on the mind, or we become mere grammarians, missing the idioms which help thought into liberty. Few languages show as much mechanical ingenuity of construction as the Chinese; it is not, therefore, an example of facile speech. Inheritance, organic force, instinct, insight, are all present in national life and in national language.

If we attempt extendedly to put language to rights under rules of construction we shall neither be able to win higher ground nor to hold the ground that we seem to have gained. If we have not succeeded in exterminating the growing tendency we shall at once begin to be embarrassed by it. Pronunciation is constantly undergoing slight changes. Reformed spelling would be in constant throes of effort to hold back these changing inflections. The word economic has, within a few years, been passing from ēconomic to ĕconomic. This movement involves a change of vowel sounds which would need to be registered in a change of letters. It is not consonant with the history of living speech to suppose it capable of lying on the tongues of living men as so many well formed vocal pebbles, neither to be lost or worn or reshaped in daily use—use that is as careless, heedless and skillful as is the equilibrist with his balls.

Language must grow in form and volume. A portion of this growth is sure to come from other languages, languages not altogether in harmony with the receiving speech. Must these foreign words be subjected to violent pressure in reforma-

tion, or are they to find their way in with a strange garb, now made doubly conspicuous and painful by our enforced uniformity?

What would become of proper names under this reconstruction of English; our own proper names and other names born and shaped anywhere on the earth's surface in grotesque ways? Many good citizens love to give a little spicy novelty to their own names, and Seely becomes Seelye, and Smith, Smythe. A man is entitled to his own fancies. I should have been better pleased if my ancestors had left me those lost letters "be" in Bascombe.

Our own names would be of small moment compared with those personal and geographical designations by which we get at the world's history. How long do we struggle with them till we reach a word which makes itself at home in all our minds, and loops up the tracery of events. Are we to have a committee to pick and shorten and shape words till they are English and nothing else? Or are we to let these words stand, like table rocks on a plain, the only remainder and reminder of a time gone by when things had not yet been fretted and flooded into smoothness? One may not often be conservative, and yet think it wise to go but slowly when we are throwing the very symbols of knowledge into pie.

One in the presence of a great speech feels like a gardener, watching an unusual shrub as by leaf and curve and twist it takes on its own idioms. A penknife is enough with which to correct its errors. I speak with more earnestness, and possibly with less wisdom, because I belong to that awkward squad which cannot, in six easy lessons, puncture even the rind of any human speech, much less suck dry its juices.

LITERATURE.

Bezopfte Pädagogik; Kritische Betrachtungen über Irrgänge der Volksschulpädagogik, von PAUL LANG, Würzburg. Verlag von ERNST WUNDERLICH. Leipzig, 1907. pp. 150.

As indicated by the title, this book is a vigorous attack upon certain pedagogical old fogyisms which still persist in the German elementary schools. The author speaks first of the increasing nervousness among German school children, an evil which we are accustomed to think of as chiefly American. But he does not lay the responsibility for this upon the schools, though doubtless they have their part in it. He considers that nervousness among school children is merely a symptom of the increasing nervousness of modern society in general, due to the strenuous life, especially in cities, the social misery of large classes, of the population, alcoholism, excesses of various kinds, heredity, etc.

Against the supposed efficacy of gymnastics as taught in German schools, as a remedy for nervous strain among school children, he brings a sharp arraignment. Two hours per week instruction are given in which a prescribed manual is followed. In schools which have a gymnasium hall the exercises are conducted there, in those which have not, any available room is used; in country schools this is often the dance hall of the village, reeking with odors of stale beer and tobacco. In large schools, the classes follow each other without interval during the entire school session with little or no ventilation of the room, because a thorough change of air would waste heat and take considerable time. There is little or no time for free exercise so that the gymnastic hour is frequently merely a continuation of the strain of school work, under hygienic conditions which are no improvement on those of the schoolroom.

The next question discussed is that of home work for school children. This is universally required in Germany and it is a pedagogical heresy to question its utility and necessity. Herr Lang is, however, as a result of his own investigation, very much of a heretic in this matter, and affirms that for the elementary schools, home work is neither necessary nor desirable and, under circumstances which are by no means infrequent, positively injurious to the children. In large cities, this home work must, in many cases, be done in a crowded and noisy room, with insufficient light, an entire family often having but one oil lamp about which the elder members of the families must sit to carry on their work. Conditions are no better if the work is done during daylight hours, for window space, especially in basement tenements of which there are 25,769 in Berlin, is precious and must be utilized by the bread winners of the family. Written work must often be done on a chair, the sewing machine, window sill, or even the stairs. Under such conditions, the value of home work, from either the hygienic or the disciplinary point of view may well be questioned, and the author quotes sufficient statistics to give foundation for his criticism on present requirements.

Two chapters are devoted to the discussion of arithmetical instruction. The author protests against the merely mechanical drill which indeed produces a readiness in performing operations, but which is easily lost because of insufficient practical application. The interest

of the pupil depends upon the degree in which the subject can be brought into his actual life, and abstract reckoning has no interest for him. The arrangement of arithmetical text-books is criticised because related problems are not put together but often widely separated. Two "old fogyisms" in arithmetic against which a vigorous protest is made, are the method of teaching multiplication and division of fractions and the undue emphasis laid upon formal rules. In regard to the former, pupils are taught that multiplication and division decreases a quantity and also that a multiplier or divisor can never be a denominate number. Then, to his confusion, he is required to multiply and divide by fractions, which are denominate numbers, and the result of the process is exactly the reverse of what he has previously been taught, for multiplying decreases and division increases the quantity operated upon. It is difficult to understand why so illogical an error has been allowed to persist, when a little reflection makes it evident that the sign of multiplication or division in the case of fraction indicates not a single but a double operation *i. e.*, 20 x ¾ indicates not that 20 is to be multiplied by ¾ but that it is to be divided into four parts and three of these parts put together to form a new number. Analogous application to division is evident.

The next point of attack is the lack of progress in methods of teaching religion, a subject to which much time is devoted in all German schools. But in what does this teaching consist? Chiefly in learning by heart three catechisms, and that by the concentric method. Not that mere memorizing is supposed to be all that is necessary, but in practice, the difficulty of the subject matter, which for the youngest children consists of such questions as "Can you name some of God's characteristics?" to which a seven-year-old child is expected to answer: "God is eternal, omnipresent, all-wise, almighty, holy, good, just and merciful," leaves little time for explanation. Moreover, having mastered the smaller catechism, the pupil must then learn the middle and higher catechisms, whose subject matter is the same, but the expansion of the material changes the wording so that the earlier form interferes with and adds to the difficulties of memorizing. In any other subject such procedure would be criticised as unpedagogical but religion stands far behind other subjects in its special pedagogy. Under such a system, the indifference in regard to religion is scarcely surprising. Herr Lang would entirely do away with the catechism for the first three school years, subsituting Bible stories in its stead and would further limit the mechanical learning in order to give time for teaching which would develop the spiritual nature of the pupil, a result hardly to be obtained by mechanical memorizing of a text-book.

The last third of the book is in the form of a correspondence between two teachers, which discusses chiefly the question of individuality in its different phases, including that most frequently ignored individuality, the teacher's.

The book is evidently an outcome of experience, is clearly and pleasantly written, and though it discusses conditions pertaining to German schools, has many suggestions for American teachers.

THEODATE L. SMITH.

London County Council. Annual Report of the Medical Officer of the late School Board for London for the Year Ended 25th March, 1904.

Report of the Education Committee of the London County Council, Submitting the Report of the Medical Officer (Education) for the Year Ended 31st March, 1905.

Report of the (Education) Committee of the London County Council, Submitting the Report of the Medical Officer (Education) for the Year Ended 31st March, 1906.

Report of the Education Committee of the London County Council, Submitting a Report of the Council's Officers on Bathing Arrangements in Schools in Germany and Holland. (Order of Council of 24th July, 1906.)

The reports of the London Medical Officer are very valuable contributions to school hygiene. Dr. Kerr, the efficient inspector, gives the results of important investigations of school diseases, especially infectious diseases among London school children, and reports physical conditions. The results of weighing and measuring some 20,000 children, the results of studies of sight, hearing, and dental conditions, together with important results of investigations of ventilating, furniture, bathing, etc., are given.

Especially interesting are some inferences from the study of infectious diseases. Extended investigations of measles, diphtheria, and scarlatina have been made, and the results are given with many curves, diagrams, and tables. Many will be surprised at some of the results found. According to Dr. Kerr, "measles is the most fatal disease of childhood, and the one which plays the greatest havoc with school attendance." A record of the susceptibility of all children should be kept. It is found that, in towns, measles will spread in classes where 1/3 of the children are unprotected, and will recur until the unprotected are reduced to 1/5." School closure to be effective must occur when the first case of measles appears, but "school closure for measles can never take the place of teachers especially trained in school hygiene, imbued with the ideals that constitute a 'sanitary conscience,' and working in good hygienic surroundings." The ultimate solution in the face of an epidemic of measles will probably be the exclusion of non-protected individuals rather than the exclusion of unaffected children coming from affected households.

Dr. Kerr's study of diphtheria indicates that children should be excluded from the school until bacteriological tests show the absence of the Klebs Löffler bacillus. Where there is medical inspection, school closure for diphtheria is a confession of impotence. The danger is that the "carriers" are not discovered, and there is no guarantee that at the end of the period of closure the children who are the cause of the spread of the disease will be innocuous. W. H. B.

Vybrané state pedopsychologické a pedagogické. G. S. Hall. Se svolenim auktorovym prelozil, Mauer. Uvodem provázi Prof. Dr. Frant. Cáda, v Praze, 1906. pp. 199.

The above title is of interest to American readers because it is the title of a volume of child study papers selected from the work of G. Stanley Hall and translated into the Czech language. The translation of the title and table of contents is as follows. Selected paidopsychological Studies translated (into Czech) by Mauer with the permission author, G. Stanley Hall. Introduction by Dr. Frantisek Cáda, Prague, 1906.—Table of Contents:

Introduction.

Dr. G. Stanley Hall and His Activities.

1. Notes on the Study of Infants.
   (From *Ped. Sem.*, June, '91, Vol. I, pp. 127-138.)
2. Some Aspects of the Early Sense of Self.
   (From *Am. Jour. of Psy.*, Apr., 1898, Vol. IX, pp. 351-395.)
3. Contents of Children's Minds on Entering School.
   (From *Ped. Sem.*, June, 1891, Vol. I, pp. 139-173.)
4. Moral and Religious Training of Children.
   (From *Ped. Sem.*, June, 1891, Vol. I, pp. 196-210.)
5. The Love and Study of Nature a Part of Education.
   (From Rep. of State Board of Ag. of Mass., 1898, pp. 134-154.)

6. Children's Lies.
   (From *Ped. Sem.*, June, 1891, Vol. I, pp. 211-218.)
7. The Ideal School as Based on Child Study.
   (From Forum, Sept., 1901, Vol. XXXII, pp. 24-29.)

T. L. S.

Indian Story and Song from North America. By ALICE C. FLETCHER. Small, Maynard & Co., Boston, 1906. pp. 126.

The stories and songs of this book have been gathered by the author directly from the people in their homes, and are close translations. The melodies are exactly as sung by the Indians, the transcription of these being a task for which Miss Fletcher's musical knowledge and her sympathy and understanding of the Indian have peculiarly fitted her. Though material of this sort has appeared in scientific publication, this is the first time that it has been given to the public in more popular form. The last two chapters on the place of music in Indian life and the relation of story and song, though brief, are a contribution to the psychology of music whose value is by no means to be measured by its brevity. T. L. S.

The Carnegie Foundation for the Advancement of Teaching. First Annual Report of the President and Treasurer, 1906. pp. 84.

This report presents many features of peculiar interest. There are now fifty accepted institutions in the United States and two in Canada. Thirty-four professors in these have accepted retiring pensions, as have four widows and seven individuals, mostly in colleges not on the accepted list. Among the accepted institutions, Massachusetts and New York lead with eleven each, Ohio and Pennsylvania have four each, Wisconsin three, Connecticut, New Jersey and Vermont two each, and the rest, one each. The institution has found it necessary to make estimates of those likely to retire within another year. It has held various conferences to establish its methods and has an educational standard based upon admission requirements, and those institutions which fall below this standard will forfeit membership. The funds now at the disposition of the institution are $10,272,740. An appendix gives the act of incorporation and the rules and by-laws so far adopted.

Carnegie Institution of Washington Year Book No. 5, 1906. Published by the Institution, Washington, 1907. pp. 266.

This is the fifth year book of the Carnegie Institution and shows on the whole commendable progress. It would seem that in the number of investigators now employed by the institution workers in biology or zoölogy led, with those in physics, chemistry, archæology and astronomy following in this order. One looks with interest, but with disappointment, for the report of the work of Luther Burbank to whom $10,000 annually has been granted for a term of years. We are only told that the earthquake did no damage and that the work of collection and crossing is going on. This report is made interesting by a number of full page photographic illustrations of the various plants in which the institution is interested.

The Broadening Path. A treasure book for boys and girls, together with firelight and children's faces. A book of help for fathers and mothers. By WILLIAM BYRON FORBUSH. Bowen & Co., Indianapolis, 1907. 2 vols., pp. 1556.

Dr. Forbush has here brought together, after a long experience of work with boys, a vast and well chosen body of material in the form of stories, literary extracts, historic incidents and myths, graded to fit the different stages of life in boyhood. Some are to be read, others

to be memorized, some address the physical and psychical individual, some attempt to broaden social life and all seek to develop even broader answers to the question what we should become, how, when and where. The writer has a scheme of virtues, many in number, of the home, school, country, business and social life. They are directed to increase cleanliness of life, speech, to broaden concentration, courtesy, daring, energy, enthusiasm, efficiency, fairness, firmness, hospitality, justice, kindness, moderation, patriotism, pluck, prudence, general self-control, thrift, sympathy, tact, etc. The volume contains many interesting full-page illustrations, and a very wide range of literature and history has been culled to make these selections.

The Profit of Love; studies in altruism. By A. A. McGinley. With preface by Rev. George Tyrrell. Longmans, Green & Co., New York, 1907. pp. 291.

It has a biblical and often a theological tang to it. Its illustrations and sentiments are also often clerical. It is, nevertheless, a work of erudition, good sense, and is permeated with a strong desire to improve not only individuals, but the race. It is an excellent expression of the social endeavors of the church and those that coincide with it outside. The author insists that we need men and women rather than schemes or systems, that remedies against current evils are to be sought in character rather than legislation, that we must work at the roots rather than at the branches and that the overwhelming trend of the present day toward selfishness and utilitarianism must absolutely be fairly and squarely met and overcome by a spirit of altruism. The author would have the mother do more in teaching her child, would emphasize the spirit of human sympathy, of unselfish devotion in the school, and appeals to woman to make the spirit of her self-sacrificing life more potent in the world where it was never so much needed as now.

Essays on English Studies. By Henry H. Hudson. Edited with preface, introduction and notes by A. J. George. Ginn & Co., Boston, 1906. pp. 206.

The editor has done well to give us in a tasteful volume the essays of this noted school Shakspere editor who did pioneer work in making the study of English literature popular in private classes as well as in high schools and college. He was an enthusiastic humanist and dreaded nothing so much as lest methods which prevailed in teaching classics should prevail in the study of literature. His fears, alas, were only too well grounded, for the minute, exegetical, philological style he abhorred has, despite his efforts, grown rank in the schoolroom. His paper on How to use Shakspere in Schools, his discourse on Daniel Webster, his characterization of the Value of Shakspere as a Text-book and his general theories on English in Schools are even yet most timely.

Die Experimentelle Pädagogik, Organ der Arbeitsgemeinschaft für experimentelle Pädagogik mit besonderer Berücksichtigung der experimentellen Didaktik und der Erziehung schwachbegabten und abnormer Kinder. Herausgegeben von Dr. E. Meumann. Nemnich, Leipzig, 1906. pp. 128.

We regret to learn that Professor Lay has been obliged, on account of family matters and certain criticisms on his mode of making use of the work of other people, to withdraw. This number contains four valuable articles. The first, by Lobsien, demonstrates the variations of memory which are ascribed respectively to fatigue, practice, different individual developments of mental power, acuteness of attention,

sex, season, social relations and the psychical constitution of individuals. Meumann contributes an article on the methods of determining different types of concepts; Neumann on the doctrine of the economy and technique of learning, and the volume contains the usual large number of reviews.

School Hygiene and the Laws of Health. A text-book for teachers and students in training. By CHARLES PORTER. Longmans, Green & Co., New York, 1906. pp. 313.

These lectures are based upon a course of lectures given to teachers of the Sheffield Training College, New York, and are modelled to suit the syllabus of the Sanitary Institute examination. The writer first treats of the skeleton, joint, muscular, circulatory, lymphatic, respiratory; digestive, excretory and nervous systems, and then of eye, ear and infectious diseases. The second and shorter part discusses school sites, buildings, ventilation, warming, lighting, sanitation, cleaning and school furniture. The first part is very elementary anatomy and physiology and the second part, singularly enough, has nothing to say about personal hygiene, but is limited to the hygienic aspects of buildings. The title of the book is, therefore, too broad, and we confess to a grievous disappointment.

The Teaching of Mathematics in the Elementary and the Secondary Schools. By J. W. A. YOUNG. Longmans, Green & Co., New York, 1907. pp. 351.

The author of this book addresses prospective and experienced teachers of mathematics. The writer has attempted to address both, but realizes that his work may therefore have defects for each. He first treats the pedagogy of mathematics, then its purpose and value, and then follow chapters on methods and modes of teaching heuristic and individual, the Perry movement, the laboratory method, a long chapter on miscellaneous points of method and mode. He then discusses the preparation of teachers, mathematical clubs, material, apparatus, curricula, definitions and axioms, actual teaching, arithmetic, geometry, algebra. It is a valuable and rather needed work and sheds a great deal of light in an obscure and perplexed field.

King's Illustrated Portfolio of Our Country. By W. C. KING. William C. King Co., Springfield, Mass. 1907. pp. 50.

These fifty pages rammed and crammed with facts, diagrams in all the colors of the rainbow, about every sort of historic, scientific, economic, industrial aspects that present all kinds of output, leaders of parties, inventions and what not are, we believe, of real and great pedagogic value. They open large bodies of knowledge to the ready apprehension of the eye, which can take in at a glance things properly presented it by graphic methods, which could not be apperceived in ten times the work otherwise and some of them are masterpieces of condensed presentation. Just how all this data can be used in the schools is an interesting problem, but as a leading table of handy reference such a work is a real accession to the repertory of the teacher.

Elementary English Composition. Designed for use in the grammar grades and the lower high school grades. By TULEY F. HUNTINGTON. The Macmillan Co., New York, 1907. pp. 357.

The author has, above all things else, tried "to come close to the hearts of Tom and Alice." The text is a letter addressed to these boys and girls. The theme is objective and the writer has had the adolescent stage particularly in view. He seeks also to convince boys

that composition work is really worth doing. It is designed for upper grammar and lower high school grades. The chief subjects treated are oral composition; the written theme; paragraphs, sentences and words; punctuation; letter writing; school works; narration and description from novels; explanation; and argument. The book contains fifteen photographic reproductions illustrating its subject matter.

Second International Congress of School Hygiene, London, August 5th-10th, 1907. Preliminary Programme. London, 1906. pp. 71.

Great preparations are being made in England for a meeting at which a great many different associations are to be represented. It is to last a week, is organized with a very efficient general society, with large committees scattered over the Empire and has no less than eleven different sections. Organizations, too, in every country in Europe are enlisted, and attempts are being made to bring together not only all members of the permanent international committee, nearly two score in number, but the leading experts in all related fields.

Observations on the Florid Song or Sentiments of the Ancient and Modern Singers, written in Italian by PIER. FRANCESCO TOSE. Translated into English by Mr. Galliard. Wilcox, London, 1895. pp. 184.

This is a reprint from an original printed at Bologna in the year 1743. The chapters are on cadences, airs, the recitative, the shake, the appoggiatura, passages of grace, observations for singers, air, teachers of sopranos, etc. It is a very unique and quaint exposition of the ancient florid mode of operatic singing. The author has an intense self-consciousness as to the importance of his art. The chief reflection in reading this book is the immense difference between the style once in vogue and that practiced by great singers now. Traces of this are still seen upon the Italian stage and these fashions have especially survived in the singing of operas written in the last century and given in Italian. Otherwise these fashions are as much passé as are the old styles of florid oratory.

Department of the Interior. Bureau of Education Bulletin, No. 3, 1906. State School Systems: legislation and judicial decisions relating to public education October 1, 1904-October 1, 1906. By EDWARD C. ELLIOTT. Washington Printing Office, 1906. pp. 156.

This is one of the first publications of the Bureau of Education under its new chief, and comprises a survey of school laws for two years, ending October 1, 1906. These are grouped under the following heads: administration, control and supervision, state finances and support, local finances and support, buildings, sites, teachers in elementary and secondary schools, employment, professional training, etc., school population and attendance, discipline, health, text-books and supplies, subject matter of instruction, typical schools, secondary legislation, professional, higher and private institutions, libraries, and the education of defectives and delinquents with a supplement of recent decisions of state supreme courts.

A Sentiment in Verse for every day in the year. Compiled by Walter L. Sheldon. Ethical Year Book, No. 11. Weston, Philadelphia, 1906. pp. 116.

This collection of poems might be considered as a contribution to ethical culture or to moral education. There is little, if anything, in the selections that could offend religionists of any sect. It is a curious recrudescence of the very inveterate ancient custom of having Bible texts printed in almanac sequence, which used to be entitled "Daily

Food" or "Spiritual Guidance," and perhaps may have some psychological connection with the old idea of reading the story of a saint for each day in the year, or having each named in the church calendar as an anniversary of a saint. It may also be regarded as in some sense a survival of the old morning or evening prayers.

The Universal Kinship, by J. HOWARD MOORE. Charles H. Kerr & Co., Chicago, 1906. pp. 329.

This is a very interesting, suggestive and original bit of pedagogic work. The author is instructor in zoölogy in a manual training high school and has undertaken to bring together the recent results of science, and show a physical, psychological and ethical kinship between man and animals. In the 28 short chapters, he treats such topics as man as a vertebrate, mammal, and primate, homology, genealogy of animals, factors of organic evolution, the conflict between science and tradition, psychological evolution, the development of the human and non-human minds compared, human nature as a product of the jungle, the ethics of the savage or ancient and the modern man, provincialism, altruism and the ethical implications of evolution.

Principles of Secondary Education, a text-book. By CHARLES DE GARMO. The Macmillan Co., New York, 1907. pp. 299.

In the introduction of this book, Dr. de Garmo treats the social and the individual basis of education and then discusses how secondary studies were selected in the past and how they should be now with a hierarchy of aims, rich and abundant material, should have reference to the claims of all classes of society and the time and strength of the student, etc. He tells us how sciences and humanities and economics should be classified and how they are distinguished as a true beauty and goodness, discusses separately each of the exact, the biological and the earth sciences, then takes up language, fine art, history and economics. The fifth chapter discusses the organization of studies into curricula, the selection of topics, the election by students, the correlation of high school studies with a scheme for the same and lays down certain rules for the construction of such courses, viz., juxtaposition versus section, unity, acquisition, of efficiency, the order of languages, etc.

Congress of Arts and Science. Universal Exposition, St. Louis, 1904. Edited by Howard J. Rogers, Volume VII. Houghton, Mifflin & Co., Cambridge, 1906. pp. 872.

This volume is devoted to economics, politics, social regulation, jurisprudence and social science and contains nearly seventy papers treating of very fundamental topics, often with bibliographies, many of which are written by those of international fame, a dozen or so of whom are foreigners.

Congress of Arts and Sciences. Universal Exposition, St. Louis, 1904. 8th volume. Edited by Howard J. Rogers. Houghton, Mifflin & Co., Boston, 1907. pp. 493.

This is the most interesting in this series for teachers because it contains twelve rather extended educational papers and a number of abstracts and bibliographies. The religious section comprises the other half of the book by as many writers, whom we do not think as representative as are the pedagogues.

A German Scientific Reader, with notes and vocabulary. By WILLIAM H. WAIT. Macmillan Co., New York, 1907. pp. 521.

The author prints here selections from the work of German specialists in several different fields of science in a way to afford a connected

chapter on each topic. They are chemisty, physics, geology, mineralogy, astronomy and anatomy. The last 80 pages of the book contain a vocabulary. The idea is an excellent one, but the book is open to the grave criticism of defective size and clearness of type.

L'Organization de cours de traitement pour enfants troublé de la parole, par GEORGES ROUMA. Engelman, Leipzig, 1906. pp. 170.

The writer has made a long study of speech defects and here attempts to present with considerable detail for the benefit of the public, a catalogue résumé of his methods of treatment with the justification of each step. He appends a brief interesting survey of the schools and methods in other lands, especially in Europe.

Die Entwicklung des deutschen Städtewesens, von HUGO PREUSS. Teubner, Leipzig, 1906. pp. 379.

The first chapter is on the development of the German cities. Then follow chapters upon their culmination and decline, the relation of cities to and under an absolute ruler, the regeneration of the city under autonomy, the development of their constitutions to the present time.

Life in Ancient Athens; the social and public life of a classical Athenian from day to day. By T. G. TUCKER. Macmillan Co., New York, 1906. pp. 323.

This is an interesting book, illustrated by 85 cuts depicting remains of ancient Athenian culture. It has chapters on public buildings, streets, citizens, outlanders, slaves, women, house and furniture, the social day of a typical citizen before, during and after dinner, woman's life and fashion, boyhood and training, army and navy, religion, festivals, council and assembly, trial, burial and art.

A Short History of Ancient Times for colleges and high schools. By PHILIP VAN NESS MYERS. Ginn & Co., Boston, 1906. pp. 388.

The author here revises the last half of his general history with such changes as were necessary to make the book an independent one. The survey begins with the barbarian kingdoms and ends with present day expansion in England, France, Germany, Russia and other countries.

Town and City. (Gulick Hygiene Series.) By FRANCES GULICK JEWETT. Ginn & Company, Boston, 1906. pp. 272.

This third book in the Gulick Hygiene Series treats of the growth of cities, overcrowding, reforms, alcohol, clean streets, garbage, ashes, rubbish, parks, playgrounds, baths, fires, water, supply and waste, sewerage, preventable disease, tobacco, food inspection, epidemics, vaccination, tuberculosis, mosquitoes, hospitals, dispensaries, ambulance.

The Child Mind, a study in elementary ethology. By HENRIETTA HOME. Mathews, London, 1906. pp. 48.

This is a rather slight, very brief, sketchy, literary, philosophic, poetic, maternal series of four chapters quite impossible to describe, if indeed it were seriously worth while to attempt to do so.

Der Trompeter von Säkkingen. Ein Sang vom Oberrhein. Von JOSEPH VICTOR, von SCHEFFEL. With introduction, notes, vocabulary and repetitional exercises by Herbart C. Sanborn. Ginn & Co., Boston, 1906. pp. 590.

Iphigenie auf Tauris. Edited with introduction, repetitional exercises, notes, and vocabulary by Philip S. Allen. Ginn & Co., Boston, 1906. pp. 218.

Novelas Cortes, by DON PEDRO A. DE ALARÇON. Edited with notes and vocabulary by W. F. Giese. Ginn & Co., Boston, 1906. pp. 234.

Journal of the Proceedings of the 52nd Annual Meeting of the Illinois State Teachers' Association and Sections held at Springfield, Illinois, December 26-28, 1905. Illinois State Journal Company, 1906. pp. 194.

Report of the Inter-Departmental Committee on Physical Deterioration. Volume I, report and appendix. Presented to both Houses of Parliament by Command of His Majesty. Darling & Son, London, 1904. Reprinted 1905. pp. 137.

The President's Report of the University of Chicago, 1905-6, with publications of members of the University, July, 1905-July, 1906. University of Chicago Press, Chicago, 1907. pp. 177.

State of New York. State Commission in Lunacy. Seventeenth Annual Report, October 1, 1904, to September 30, 1905. Transmitted to the Legislature January 31, 1906. Brandow Printing Co., Albany, 1906. pp. 1146.

A Short History of Mediæval and Modern Times, for colleges and high schools. By PHILIP VAN NESS MYERS. Ginn & Co., Boston, 1906. pp. 438.

THE BERLIN CONGRESS FOR CHILD STUDY.

The first International Congress for Child Study was held at the University of Berlin, Oct. 1-4, 1906, and was attended by nearly seven hundred people from Germany and other countries. This gathering was composed of University professors, teachers from the secondary and peoples schools, physicians, clergymen, lawyers and parents of the cultured class. To facilitate the work, the congress was divided into three parallel sections, the anthropological-psychological, the psychological-pedagogical and the philanthropic-social. Some of the addresses, which were of general interest, were given before a joint assembly of the three sections. The reports of those following are derived from the "Bayerische Lehrerzeitung" and "Blätter für die Schulpraxis. Dr. Adolf Baginsky, Professor of Children's Diseases at the University of Berlin, spoke on the Impressionability of Children under the Influence of Environment. His chief points were as follows: Every physician who specializes in children's diseases is impressed by the fact that children, even although their life conditions, environment and influences are similar, present quite different characteristics of illness, and many cases show that a mere change of surroundings may be a powerful remedial factor. This he considers due not merely to its effect upon the pathological conditions present in any particular case, but rather to the influence upon the entire personality of the child. The effect of the change of surroundings is incomparably greater in children than in adults, because in the child, ideas and associations are far more unstable than in the adult and therefore more easily displaced by new impressions. In children also the influence of impulses is very great, whether they exist from birth or are a result of custom and training. Especially powerful are the impulses of imitation and the functional impulses under the influence of pleasure and pain sensations. Children are also peculiarly liable to confuse their own ideas with reality. This is a source of phantasy, illusion, autosuggestion, and also of pathological fear and children's lies. The

pedagogical significance of this fact has long since been realized, but in Germany its legal importance has not been sufficiently recognized. In Dr. Baginsky's opinion, children's statements in court are, as expressions of the actual knowledge of the child, entirely worthless, and the more worthless the oftener they are repeated, since the repetition increases the belief of the child in their reality. In Sweden, no witness under fifteen years is legally competent. I would almost pledge myself, said Prof. Baginsky, to obtain from a child, up to eight or nine years, under examination, whatever statement I desired to obtain. The address was concluded with a plea for the exclusion of child witnesses from court.

Dr. Ernst Meumann, Professor of Philosophy and Pedagogy at Königsberg, read a paper on the Scientific Investigation of Differences in the Mental Endowments of Children and its Practical Significance. This was a discussion of the pedagogical problems involved and the need of some methods of distinguishing between the natural capability of a child and his actual performance. Any scheme for classifying pupils according to their ability must depend upon the scientific solution of the psychological problems involved and the discovery of adequate tests. Dr. Meumann's paper aroused an interesting discussion on the comparative value of the methods of observation and experiment, ending with the agreement that they should supplement and not oppose each other.

Director Christian Ufer of the School for Girls at Elberfeld, discussed the Relation of Child Study to Pedagogy. He expressed some doubt as to whether child study can ever, as some of its more enthusiastic advocates have claimed, furnish an exact scientific basis to pedagogy. Its present achievements, at least, do not justify that claim. The mental development of the first six or seven years have been well studied and the results are of great value for the home and kindergarten, but for the school years we have as yet comparatively little that can be used to ground pedagogy on an exact scientific basis.

Dr. William Ament, of Wurzburg, gave a historical sketch of child study from the close of the 18th century, including a sketch of the literature from Locke (1695) to Preyer (1882). The title pages of the various works mentioned were shown by lantern slides.

Dr. Felisch, Privy Councillor of the Admiralty, discussed ways and means of caring for children who leave school between fifteen and eighteen to become wage earners. Here, state, church, school and citizen association should work together. Dr. Felisch would have a special organization to look after these children. Its duties would be to help the child choose his vocation, and here his teachers can give aid and counsel, to help him avoid bodily and moral harm, to aid in establishing good relations between the child and his employer, to see that young workers away from home are provided with suitable boarding places and to provide for the continuance of education by special evening classes, etc. For the children brought up in Berlin orphanages, his programme is actually carried out, and Dr. Felisch would widen the scope of this parental care to include all those needing it.

Dr. Heubner, Professor of Children's Diseases at the University of Berlin, gave some statistics in regard to the number of idiotic and feeble-minded children occurring in his own practice. Out of 9,200 children examined by him, there were 307 with enfeebled intellects of whom 259 were actually imbecile. His address was chiefly a plea for institutions where these children can be given proper instruction and care. Much may be done to alleviate and improve their condition, under favorable environment, but for poor children the number of such institutions is at present utterly inadequate.

Dr. Eduard Martinak, Professor of Philosophy and Pedagogy at the University of Graz, spoke on the Nature and Problems of a Science of Pupils (Schülerkunde). Under the term Schülerkunde are included all problems of investigating the bodily and mental life of school pupils, with especial emphasis on all phenomena which stand in causal connection with the school life as such. This would include pupils of all ages from the legal age of school entrance, six years, to the close of the secondary school period or about twenty. Dr. Martinak paid a high tribute to Dr. Hall's work in Child Study and announced the forthcoming German translation of "Adolescence" by Dr. Joseph Stimpfl.

He suggested that sources from which valuable data could be obtained for such a science would be a statistical collection of the later history of former pupils, exercise books kept throughout the entire school life, biographies, etc.

The preparation of the teachers should, he thought, include a broad training in psychology and a practical experience with children both in and out of school. Among the numerous problems of "Schülerkunde" suggested were:

1. The pupil and his daily life (programme of the day, sleep, mealtimes, cleanliness, clothing, order, etc.).

2. The pupil and the school; (a) his relation to the teacher and the school; (b) to his fellow pupils; (c) to the subject matter of the curriculum (the range of interests of the pupil: undercurrents in his mental life); (d) reflex influence of school life upon the total behavior of the pupil.

4. The pupil and nature, (a) nature as an object of knowledge; (b) nature as an object of æsthetic feeling; (c) influence of nature, *i. e.*, climate, seasons, on the pupil.

5. The pupil and art, and the beautiful in general. (Art Education.)

6. The pupil and his relation to religion (storm and stress period).

7. The pupil in relation to his fellow men; friendship, egoism, altruism; relation to rich and poor, old and young, high and low, to the sick, to societies and associations, and especially relations to the other sex (awakening inclination, love, co-education).

8. The pupil's attitude toward himself, health, purity, strength, beauty, the spiritual ego: self feeling, honor, depressive truth, etc.

In addition to this group of problems belonging to the general subject are many other topics of a more specialized nature, some of which have already received monographic treatment but in which there is still much to be investigated. Such are speech problems, reading, play, collecting instinct, money sense, punishment, faults and crimes, political understanding and interest, ideals, etc. In closing Dr. Martinak emphasized the need for concentrating and unifying the work already done in those lines.

Wilhelm Kulemann, Councillor of the Provincial Court at Bremen, discussed the Legal Treatment of Youth. The line of demarcation between classes of youth in the existing criminal code is at fault in so far as it is grounded on the purely intellectual ability of the culprit to distinguish right and wrong and does not take into consideration the factor of will. It would be better to replace the anthropological by a pedagogical distinction which should take into account the environment and personality of the culprit. In the treatment of juvenile offenders, three modes of reaction on the part of the state are possible namely, education, punishment and such course of action as shall prevent further offences. The first is applicable exclusively to children, the second to adults; adolescents form a middle class. The possible modes of treatment for this class are either educational, (a) supervision and direction by the state of the offender in the home,

(b) placing the offender under guardianship of another home, (c) placing the offender in an institution; or punitive, (a) reproof, (b) fines, (c) arrest, (d) imprisonment. All cases of this class should be in the hands of a special court consisting of a judge and other members among which should always be a teacher and a physician.

The foregoing lectures were all given before the assembled congress. Those given in the three sections were so numerous that space permits mention of only a few of them. In the anthropological section, Dr. William Stern, Private Docent at the University of Breslau, spoke upon the Fundamental Questions of Psychogenesis. These questions are of special importance to (1) child psychology, (2) for pedagogy which can reach its ideal of the normal development of the child only through knowledge of the fundamentals of soul development, and (3) to the science of culture. Dr. Stern treated the subject under three heads, (1) the facts of psychogenesis, (2) its causes, (3) the genetic parallelism. Quantitatively considered, all evolution is ascent or growth; qualitatively considered, it is not proportional growth, but a series of metamorphoses with continual alteration of relations. Temporarily considered, all psychic evolution is rhythmical. Causes of psychogenesis were discussed under the heads external and internal. Under the former were included food, climate, education and environment. Under internal causes were included heredity, sex distinctions and individual peculiarities. On the one hand stands empiricism and on the other nativism; the truth must be sought in a synthesis of the two. The third section, the psychogenetic parallelism was a tracing of the familiar analogy between the child and the race.

Dr. Alfons Engelsperger, teacher in the peoples school at Munich, contributed a statistical study to the knowledge of the physical and psychic nature of the six-year-old child on entrance to school. The subjects of the study were five hundred six-year-old children entering the Munich schools. Careful measurements of their height and weight were taken at entrance and again after eight weeks of school life. 85% of these children were found to lose from two to three pounds in weight during the eight weeks. It was also noted that the children entering school under six were less amenable to instruction than those entering at the full age. These facts point to a need of co-operation between family and school to lessen this evident injury to the children. Here there is a pressing need for the students of child psychology to investigate ways and means by which the critical passage from home to school life may be made without interfering with normal development.

Director Johann Delitsch, of the high school at Plauen, spoke on the subject of Individual Inhibitions of Attention in School Children. These were frequently not due to any moral delinquency and should not be so treated, since they may be due to physical causes. They may be (1) somatic, *e. g.*, tooth and headache, stomach troubles, hunger, thirst, anæmia, circulation, etc., (2) sensorial that is due to eye or ear defects or (3) purely cerebral, associative inhibitions. The teacher, the school physician and parents should co-operate in the investigation and proper treatment of such pathological cases.

Dr. Theodor Elsenhaus discussed the Natural Endowments (Anlage) of Children. This concept of natural endowment is practically an unknown quantity which conditions the development of the child. On the one hand we have those who make the natural endowment the main thing and on the other those who would exalt education and lay little stress on inborn disposition. But neither is sufficient in itself. Natural endowments must be cultivated and controlled by educational methods to bring them to their fruitage.

Dr. Ferdinand Kemises, of the Real-gymnasium at Weissensee, Berlin, contributed a valuable study on the Question of Children Lies,

giving some results of an extensive research which has been carried on by the Berlin Verrein für Kinderforschung.

Dr. Friedrich Schmidt, teacher in Wurzburg, presented an experimental study on home and test exercises. Composition work at home and in school was used as subject matter and the errors of each class of work marked according to a specified scale. The chief general result of this study was that the home work in the case of the girls showed a better style than the school work and the reverse was the case with the boys. Some qualitative differences in error between school and home work were also shown.

Dr. Alwin Pabst, Director of the Teachers Seminary for Manual Training at Leipzig, spoke on the Psychological and Pedagogical Significance of Manual Training.

The development of the brain as an organ not merely for thinking but also for human will and action is dependent upon motor as well as sense training. The usual sharp distinction between brain work and handiwork is a false one. There is no handiwork which does not at the same time demand more or less brain work and the question is one of the degree in which the brain is called into activity. For this reason bodily movements, play, gymnastics and manual work are necessary to the development of the brain. Motor activities condition character and will and are a needful part of education. The skilled handwork involving the finer muscles works upon the brain quite differently from the movement of the heavier muscles, and the skilled hand is a sense organ comparable to the eye or ear. Speech, music, painting and sculpture are all forms of psychological activity in motor terms. The education of the future must include muscle training as a necessary part of the developmental process.

Dr. Hans Schmidkunz, of Berlin, spoke upon the later years of Adolescence, especially in its importance for academic pedagogy. His concluding remarks briefly summarized the conclusions to be drawn from the congress as follows:

1. Pedagogy must still more than it has yet done be based upon Child Study, which must not be limited to the earlier stages of childhood but must take into consideration later childhood and adolescence.

2. In Child Study, as in medicine, the method of experiment and the method of observation are not in opposition to but supplement each other.

3. Psychological instruction in the teachers seminaries must be a child psychology; not merely the normal phenomena of the child's psychic life but also the most frequent pathological phenomena must be treated.

4. In education practical instruction must be emphasized more than formerly.

THEODATE L. SMITH.

NOTES.

The Bureau of Education has received, through the Department of State, the following report from the American legation in China in regard to educational reform in that country:

"This Legation has sent a number of reports to the Department upon the subject of Educational Reform in China.

"In more than one of these attention was invited to the rapid increase in the number of Chinese students who were being sent abroad for education. Most of these students have gone to Japan, but a number have been sent to Europe and America.

"The adoption of a public school system on modern lines, and the abolition of the old system of examinations, gave a strong impetus to the movement.

"No definite arrangements have been made as yet for the conferring

of degrees in connection with the new public school system, but, as an increasing number of students are returning from foreign colleges and universities, it has become necessary to make special arrangement for their examination with a view to granting them Chinese degrees and assigning them to official posts. This is the more imperative because of the great need for men acquainted with modern sciences and international law in various branches of the government service.

"The first degrees conferred upon such students by the Imperial Government were granted in the summer of 1905, when fourteen returned students were thus honored.

"This year arrangements were made for another examination, the results of which have been made known. The number of applicants for examination was 53, but only 42 were admitted, of whom 23 had studied in Japan, 17 in the United States, and one each in Great Britain and Germany.

"The students were examined in the branches covered by their foreign degrees. By a mistake of the examiners two of the American students were improperly classed and failed to receive the examination intended.

"Those receiving marks of 80 per cent. or upwards were granted the degree of *chin shih*, or Doctor; those marked from 70 per cent. to 80 per cent., a first grade *chu jen*, or M. A., and those between 60 per cent. and 70 per cent. a second grade M. A.

"The papers were prepared in English by students who had studied in the United States, Great Britain and Germany, and in Chinese by those who had studied in Japan.

"The result was that 9 gained the Doctorate, 5 the first grade M. A., and 18 the second grade M. A. Ten failed, including the two American students who were improperly classed.

"Of the nine Doctors, eight studied in the United States and one in Great Britain. The first place was taken by a graduate of Yale. One of the Doctors is Mr. W. W. Yen, a professor in St. John's College (American Episcopal Mission), Shanghai, who is, I believe, a graduate of the University of Virginia.

"Among the first grade M. A.'s are Mr. S. Alfred Sze and his brother, Thomas Sze, graduates of Cornell. The former was Secretary to Professor Jenks during his conference with the Chinese Government upon the subject of the establishment of a new monetary system for China. Mr. Sze has since been appointed General Superintendent of the Peking-Hankow Railway." ELMER ELLSWORTH BROWN,
Commissioner of Education.

A movement in the direction of play-education, something radically different from the formal, prescribed kindergarten course, has recently been made in London by the promoters of the Guild of Play. In a recent conference of the teachers under the London County Council, as reported in "Education" (London), for Feb. 1st, 1907, Mrs. Kimmins describes the plan and purpose of the venture.

There has been, of late, a feeling against the stiffness and severity of the physical drill in the prescribed school course even for the better class of children, those physically fit for it, and schoolyard games are being more encouraged; but the educational value of the old singing and dancing games, that were in vogue before formal schooling laid its mandate on the little players, and which are so rapidly declining, has not been recognized. The Guild of Play seeks to revive the old country dances, such as the morris-dance, which, it is claimed, is superior to all others as a physical exercise. The minuet, also, is arranged both simply and elaborately for younger and for older children. For the youngest, the singing games, so many of which have been collected from all parts of England by Mrs. Gomme, in her two vols. contributed to the "Dictionary of British Folk-Lore," have proved most beneficial. Of games, ball in its various forms is best,

and skipping is as beneficial as enjoyable to those in proper physical condition. And in this connection, the Guild of Play makes a strong point of careful study of home conditions before arranging for games. Thus, under-fed children or those of weak heart should not skip, while on the other hand, a letter comes from a "water-side" mother complaining that skipping makes her daughter eat too much.

A systematic study of the old rustic dances has been made by Mr. Cecil Sharp, and in the light of such researches the "water-rats" of London are to be collected on the playgrounds of the Council schools and wherever else space can be secured, and taught, or re-taught, the self-development known to the open-air children of earlier generations before the bitter stress of crowded modern life made them forget it. Self-government, and co-operation between parents and teachers are kept constantly in view, and at the Bermondsey University Settlement, where the Guild of Play has been for some time at work, it is regarded as the indispensable supplement of the day's teaching in school. It is hoped, too, to move the authorities to a greater recognition of the place of the playground and the play-hour in the education of children. E. W. COFFIN.

Professor Patrick Geddes, the creator of the Outlook Tower in Edinburgh, with the co-operation of a committee of his friends will open, at the end of February, 1907, a unique exhibition of toys. The exhibit falls into two classes; first, anthropological or natural; second, scientific or artificial toys. The former class results from the child's need of outer objects upon which to exercise and develop his powers. They may have been elaborated or even invented by adults and are sometimes genuine works of art. The latter class are more deliberate inventions with the intention of guiding and developing the powers of the child. A temporary loan collection is divided into the following classes: 1. Ancient Toys—Rattles, Dolls, Animals, etc. 2. Historical Toys—Dolls, Toy Soldiers, Models of Animals, Houses, Ships, Implements, Diminutive Armor, Weapons, etc. 3. Toys from Remote Countries—Dolls, Models, Toy Weapons, Tops, Kites, Puzzles, Simple Mechanisms, Rudimentary Musical Instruments, etc. 4. National, Local, Traditional Toys (such as exist even yet in great variety among village children). 5. Works of Art representing Children at play. 6. Pictures or Photographs of Children or Savages at play.

Artists are invited to exhibit toys of their own creation under the usual conditions of art exhibitions with a commission on the price of all works sold. Each will be placed advantageously. Mathematicians, physicists and educators are invited to exhibit toy apparatus, puzzles, illustrating physics, etc. Parents and teachers are invited to exhibit toys which they consider reasonable. Competitions will be opened and prizes offered for the best. 1. Model House (or group of houses). 2. Doll's House (Interior). 3. Model Vehicle. 4. Model Ship. 5. Mechanical Toy. 6. Scientific Toy. 7. Animal or animals carved in wood. 8. Animal or animals not carved in wood. 9. Plaything made of valueless, or nearly valueless, material.

The third section is open to children who may exhibit anything they have made or invented. These will be exhibited in classes in which boys and girls and children under five, seven, ten, and sixteen, respectively, will be distinguished. American contributions are solicited.

The Outlook Tower presents very attractive courses of lectures for the Spring of 1907. Eight are by Professor Geddes on the "Origin of Cities," six by Dr. Brock on the "History of Medicine," five on "Teaching Modern Language," by Dr. Schlapp. Others on nature study, embracing such subjects as sun dials, the meaning of fossils, the Swiss vales and Scotch highlands contrasted, etc. There are also demonstrations in art and in science open to teachers. G. S. H.